Volume I

EXPLANATORY NOTES

for

DEPARTMENT OF AGRICULTURE

Fiscal Year

1952

CONTENTS

194501

PREFACE

Project statements -

The obligations shown in the project statements are on the basis of the appropriations and activities proposed in the 1952 Budget estimates and reflect in several instances a consolidation of items to simplify the appropriation structure and the administration of the work involved. Where applicable, the activities reflected in the project statement are further divided into subcategories in order to include detail similar to that previously provided.

It should be noted that it has not been possible, especially in the case of the project statement amounts which are reflected in parentheses for the subcategories, to base the obligations shown in all cases upon data taken directly from accounting records that are formalized by specific account classifications. Wherever, because of the nature of the activity, it has been necessary to distribute certain costs which are not directly available from the accounts, every effort has been made to allocate such charges as accurately as possible based on past experience, periodic time reports, or other factors.

Explanation of adjustments for transfer of certain space and procurement functions to General Services Administration -

The Budget estimates reflect necessary adjustments to provide a direct appropriation to the General Services Administration beginning in fiscal year 1952 for certain space and procurement costs previously paid from the appropriations to the Department.

Under section 2 of Reorganization Plan No. 18 of 1950, three general purpose Federal office buildings which had been under the custody and operation of the Department of Agriculture were transferred effective July 1, 1950, to the General Services Administration. Funds to cover maintenance and operating expenses during fiscal year 1951 have been advanced to GSA from the applicable appropriations of the Department. Appropriate adjustments totaling $44,641 have been made in both the 1951 and 1952 amounts shown in the 1952 Budget schedules and Explanatory Notes for the appropriation items affected.

In addition, under section 1 of Reorganization Plan No. 18 of 1950, certain space assignment and leasing functions of the various Federal agencies have been transferred to the Gereral Services Administration. These functions, applicable only to general purpose space occupied by this Department in 128 metropolitan areas, include the acquiring and payment for space in buildings, the assignment and reassignment of such space, and the operation, maintenance, and custody thereof. Leases of the Department pertaining to special purpose space in these areas were not transferred nor were leases outside of these areas which will continue to be administered and paid for by the Department. Effective January 1, 1951, the General Services Administration assumed responsibility for the leases involved in the transfer and the agencies of the

Department will make appropriate advances of funds to reimburse GSA for costs to be incurred during the balance of fiscal year 1951. Beginning with fiscal year 1952, the Budget estimates provide a direct appropriation to be made to GSA for this purpose and therefore the Budget schedules for the Department and Explanatory Notes reflect appropriate reductions totaling $1,373,830 in the appropriation items affected. Because of the nature of certain funds available to the Department, such as trust and corporate, the Department will continue to reimburse GSA for costs under certain leases in the metropolitan areas involved even though the jurisdiction over these leases has been transferred to GSA.

In the 1951 Budget estimates and the 1951 Appropriation Act, provision was made for a direct appropriation to GSA for the overhead and indirect costs of handling purchases with appropriate reductions in the appropriations of the agencies of Government that buy through central procurement. In order to provide for a direct appropriation to GSA to cover all of the handling costs on purchases made through central procurement, the 1952 Budget estimates propose an appropriation increase to GSA for all such costs, with corresponding reductions in the appropriation items from which these expenses have been borne in the past through payment of a surcharge. These reductions totaling $173,559 together with the decrease of $1,373,830 due to the transfer of certain space assignment and leasing functions are shown in the project statements in the Explanatory Notes for the appropriation items affected under the column headed "GSA adjustments".

In order to avoid repetition throughout the Notes, this explanation is given here, rather than under each of the appropriations involved.

Explanation of appropriation adjustments for the distribution of motion pictures -

For a number of years the care and distribution of motion pictures pertaining to the programs of the Department have been financed by transfers from the various activities of the Department to the Office of Information in pursuance of the authority for such transfers which has been carried in the annual appropriation act since 1943. This has proven to be a cumbersome, time-consuming and unnecessarily complicated procedure, which the Budget proposes to correct in 1952 by appropriating the funds involved ($19,000) directly to the Office of Information. Appropriations which in past years have reimbursed the Office of Information have been reduced in a total amount equal to the funds being added to the appropriation for the Office of Information. Approval of the proposal will constitute a distinct improvement in the management of this activity by simplifying the accounting and auditing work required and making possible a more effective program for the distribution of departmental films for use in the field.

C O N T E N T S

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RESEARCH AND MARKETING ACT OF 1946 (Title II)

Purpose Statement

Appropriations made pursuant to Title II of the Research and Marketing Act of 1946 provide for expansion of marketing research, service, and education activities in which the Department of Agriculture, the State Agricultural Experiment Stations, the Cooperative State Agricultural Extension Services, the State Departments of Agriculture and Bureaus of Markets, and other public and private agencies are cooperating in solving problems relating to the distribution and marketing of agricultural products. Such funds are allotted directly to agencies of the Department for specified projects, or to State agencies on a matching-fund basis for carrying on projects under cooperative agreements, and are used under contract or cooperative agreement with public or private agencies, institutions, organizations, or individuals.

In accordance with Title III of the Act, the Secretary has established a national advisory committee of eleven members, six of whom represent producers or their organizations, to consult with the Secretary and other appropriate officials of the Department concerning research and service work authorized by the Act; and to assist in obtaining the cooperation of producers, farm organizations, industry groups, and Federal and State agencies. This Title also provides for the establishment, by the Secretary, of appropriate committees including representatives of producers, industry, government, and science, to assist in effectuating specific research and service programs. Committees have been established under this authority to advise the Department on the principal agricultural commodities and in functional or cross-commodity areas such as cold storage, foreign trade, and transportation.

This appropriation is administered by the Agricultural Research Administrator.

	Estimated, 1951	Budget estimate, 1952
Appropriated funds	$5,932,000	$5,500,000

RESEARCH AND MARKETING ACT OF 1946 (TITLE II)

Appropriation Act, 1951	$6,000,000
Reduction pursuant to Section 1214	-68,000
Base for 1952	5,932,000
Budget Estimate, 1952	5,500,000
Decrease	-432,000

SUMMARY OF DECREASES, 1952

Net decrease in the program of marketing research, service and educational work carried out under Title II of the Research and Marketing Act	-430,500
Decrease due to providing a direct appropriation to the General Services Administration for certain procurement costs previously paid from this appropriation	-1,500

PROJECT STATEMENT

Project	1950	1951 (estimated)	Increase or Decrease: GSA adjustment	Increase or Decrease: Other	1952 (estimated)
1. Basic data and information on supplies, movements, and prices	$694,646	$641,900	- -	$-63,500	$578,400
2. Expansion of outlets for farm products	1,250,197	1,277,500	$-300	-219,900	1,057,300
3. Measurement and analysis of marketing services, costs, and margins	646,431	662,900	-200	+33,700	696,400
4. Improvement in the grading, handling, packaging, transportation, storing, and merchandising	1,620,690	1,624,800	-600	-153,900	1,470,300
5. Evaluation and improvement of marketing facilities, methods, policies, and organization and pricing practices	1,565,672	1,558,900	-400	-26,900	1,531,600
6. Over-all administration	134,960	166,000	- -	- -	166,000
Unobligated balance.....	87,404	- -	- -	- -	- -
Total available	6,000,000	5,932,000	-1,500	-430,500(1)	5,500,000

(Continued on next page)

Project	1950	1951 (estimated)
Transferred in 1951 Act to related appropriations of bureaus and agencies for activities under Title I of the Research and Marketing Act (includes unobligated balances)	+13,000,000	- -
Reduction pursuant to Section 1214	- -	+68,000
Total appropriation or estimate	19,000,000	6,000,000

DECREASE

(1) Net decrease of $430,500 in the program of marketing research, service and educational work carried out under Title II of the Research and Marketing Act.

In view of the current emergency situation each project has been weighed in terms of its contribution to defense needs. Where work could be scheduled for completion within the current fiscal year or it was possible to curtail projects without serious impairment to the total program, reductions have been made as an economy measure and to permit some expansion of work that is deemed to be of special importance in the light of existing and prospective emergency conditions.

In the interests of the defense effort, emphasis has been placed on adjustments in going research to prepare available results more quickly for dissemination to people who can make the best use of it, rather than to press for completion of the projects as previously planned. Continuation of each project beyond this point will again be reviewed in terms of its possibilities for helping to cope with problems of an emergency character.

In a number of instances projects will need to be recast to seek objectives different from those originally intended. For example, educational programs originally designed to help expand markets for products expected to be in surplus must now be changed to help consumers make the best use of products that will be available to them, especially in the satisfaction of nutritional requirements. For situations of this type, considerable flexibility will be needed in the allocation of funds to best meet developments as they arise.

The advisory committee system has been an effective device for the development of sound research, service, and educational programs. Under the emergency conditions which now exist it is expected that advisory committees will continue to be used to the fullest extent in the adjustment and development of this program to meet the needs of the prevailing situation.

These objectives are reflected in the allocations of reduced funds to the major categories of work as follows:

Basic Data and Information on Supplies, Movements and Prices: Essential data on production, stocks, and movements that have been supplied under this project for products important in an emergency will not be impaired. Reductions have been confined to research or exploratory work on methods of collecting statistics or providing market news of this type. New demands for additional data and information may arise as critical supply situations develop, and some flexibility may be required to meet these demands. Since these cannot be fully anticipated at this time, specific provision for such new or expanded services has not been possible. Projects such as those involving the collection of data on broiler chick production and estimation of beef cattle on feed are illustrative of the type of information that may need to be expanded to cover additional areas in order to assure the best use of available feed and meat supplies.

Expansion of Outlets for Farm Products: About half the total decrease in Title II work falls within this area, because prospects for surpluses of agricultural products are considerably altered as compared with conditions at the time the projects were initiated. Many of these projects, however, are being modified to seek different objectives that will be consistent with the defense program. Funds previously devoted to projects in this area concerned with the expansion of food and fiber outlets will be shifted to projects in other areas directed toward making the best use of available food and fiber supplies, or otherwise modified in line with the marketing outlook.

The Measurement and Analysis of Marketing Services, Costs and Margins: With rising prices of food products, increased attention is directed toward marketing costs and the places in the marketing system where the increases are occurring. In addition, with possible shortages of manpower, materials, and equipment, emphasis is placed upon the need for marketing research and service work to reduce marketing costs and increase marketing efficiency. Cognizance is taken of these needs in the allotment of funds under this category. Some additional work is proposed for determining the comparative advantages of performing marketing functions, such as storage, at different points in the marketing system. Several recent developments of the atomic age point to the desirability of holding more stocks at decentralized points on or close to the farms, but the costs of doing so need to be ascertained more clearly.

Improvement in the Grading, Handling, Packaging, Transportation, Storage and Merchandising: As mobilization programs are accelerated and consumer demands increase, the need for conservation of food products handled and resources used to market them assumes greater importance. Allocations under this category, therefore, emphasize work designed to effect reduction of spoilage and waste in marketing channels and studies on the conservation of manpower, materials and facilities utilized in marketing operations. The discontinuance of some completed projects, together with curtailment of others nearing completion, results in a net reduction in this phase of the program, and also permits implementing certain projects, such as those on packaging and loading techniques, that are expected to make a direct contribution to the defense effort.

Evaluation and Improvement of Marketing Facilities, Methods, Policies, and Organization and Pricing Practices: In view of the high proportion of the consumer's dollar absorbed in retail distribution, work designed to help wholesalers and retailers handle agricultural products more efficiently will be maintained, with greater attention being given to better use of facilities and equipment at hand rather than the acquisition and construction of new equipment and facilities. Further attention will be given to retail training programs to help take care of manpower needs, which are further aggravated by rapid turnover of personnel in stores. These activities, together with closely associated studies on work simplification and training methods, will be maintained or somewhat expanded, at the expense of research of a more fundamental character having promise of less immediate application in improving agricultural market operations.

CHANGES IN LANGUAGE

The estimates include proposed changes in the language of this item as follows (new language underscored; deleted matter enclosed in brackets):

> To enable the Secretary to improve and develop, independently or through cooperation among Federal and State agencies, and others, a sound and efficient system for the distribution and marketing of agricultural products under the provisions of [title] titles II and III of the Act of August 14, 1946, as amended (7 U.S.C. 1621-1629), [including the objects for which funds are available for titles II and III of such Act of August 14, 1946, $6,000,000] $5,500,000: Provided, That not less than [$650,000] $600,000 of this amount shall be available for contracts in accordance with the provisions of section 205 of said Act: * * * * *

The first and second changes in language are for the sole purpose of simplifying and shortening the wording of this item, and will in no way affect the scope or nature of the work being conducted under this appropriation.

The third and fourth changes reflect a reduction in the estimate of $500,000 below the appropriation for 1951, and a related reduction of $50,000 in the funds for research and service contracts under this item.

STATUS OF PROGRAM

The Research and Marketing Act of 1946 provided for expansion of research and marketing services in which the Department of Agriculture, the State Agricultural Experiment Stations, the Cooperative Agricultural Extension Service, the State Departments of Agriculture and Bureaus of Markets, and other public and private agencies may cooperate in solving agricultural problems.

The Act authorized appropriations for the following purposes:

Under Title I:

Section 9 -- Payments to States for research at agricultural experiment stations
Section 10(a) -- Utilization research on the development and application of present, new, and extended uses of agricultural commodities and products
Section 10(b) -- Research other than utilization

Under Title II:

Research, education, and service work on the distribution and marketing of agricultural products

Where research or service work can be carried out more effectively, more rapidly, or at less cost, Section 10(a) and Title II authorized the Department to contract with qualified public or private organizations or individuals for the performance of such work.

Title I Funds Merged. In the Department of Agriculture Appropriation Act for 1951, the Congress merged the funds appropriated for Title I of the Research and Marketing Act (Sections 9, 10(a) and 10(b)) with the related appropriations of bureaus and agencies in the Department. The purpose of this action was to facilitate budgetary consideration of proposed activities, since the consolidation served to bring together the current programs of work in a specific field which previously required separate consideration when provided for in part by allotments of RMA funds and in part by direct appropriation. The merger likewise simplified fiscal accounting and integrated the administrative processes associated with the conduct of research. Contract authority derived from Section 10(a) of the Act has been preserved to broaden the facilities that may be enlisted for agricultural research.

Title II Appropriation Maintained. Recognizing that research, educational, and service work conducted to improve the marketing system for agricultural commodities represented a new emphasis on such activities in the Department, and one which would warrant separate consideration, the Congress retained the appropriation item for Title II of the Research and Marketing Act. These funds provide for (1) allotments to agencies of the Department, (2) contracts with public or private organizations or

individuals, and (3) matching-fund payments to States where there is cooperation with Agricultural Experiment Stations, Extension Services, Departments of Agriculture, and Bureaus of Markets. Hence, the current appropriation "Research and Marketing Act of 1946" pertains solely to marketing activities authorized under Title II of the Act, with coordination of the program assigned to the Administrator of the Agricultural Research Administration.

Marketing Research, Service, and Education Program (Title II). Title II of the Research and Marketing Act provides continuous research to improve the marketing, handling, storage, processing, transportation, and distribution of agricultural products, and to facilitate cooperation among Federal and State agencies, producers, industry organizations and others in the development and effectuation of research and marketing programs to improve the distribution processes. It contains authorization to work on virtually all phases of marketing, using contractual, matching fund and cooperative arrangements with public and private agencies. Among the numerous projects operative under the program, advantage is taken of each of these authorized arrangements to conduct relevant research, service and educational activities.

The program is also designed to treat all of the major agricultural commodity groups and as many of the minor commodities as possible, and to provide significant work at each stage of marketing such as in assembly points, terminal or central markets, wholesale and retail markets. The essential objective of all the work is to increase the efficiency with which agricultural products are taken in the raw state from the farm and placed in the hands of consumers in the forms, at the times, and in the places desired by consumers.

Summary tables at the end of this section provide information as follows:

Table I - Agency Summary of Obligations under Title II Research and Marketing Act Allotments, Fiscal Years 1950 Actual, 1951 and 1952 Estimated.

Table II - Commodity Summary of Obligations under Title II Research and Marketing Act Allotments, Fiscal Years 1950 Actual, 1951 and 1952 Estimated.

Table III - Functional Summary of Obligations under Title II Research and Marketing Act Allotments, Fiscal Years 1950 Actual, 1951 and 1952 Estimated.

Selected Examples of Recent Progress:

1. Reports on Broiler Chick Movements. The data reported weekly in 7 commercial broiler areas enable the industry to analyze chick placements, determine probable marketings, and formulate better marketing and operating plans, in an effort to avoid violent and sometimes disastrous fluctuations in supplies and prices.

2. Sales of Fluid Milk and Cream Well Maintained Despite Decline in Per Capita Consumption. Dairy farmers and cooperative organizations are keenly interested in obtaining useful data on fluid uses of milk, representing the highest priced market. Current sales data are published each month for 20 markets in Northeastern areas, serving approximately 22 million people. These data indicate that in several important markets per capita consumption has declined, but aggregate sales appear to have increased slightly due to increases in population.

3. Good Progress Made in Foundation Legume Seed Program. To meet the increasing need for grass and legume seeds for conservation and soil improvement plantings, and for seeding by livestock farmers, 30 states have agreed to cooperate in the plan of rapidly increasing the seed supplies of superior varieties. The initial effort is on the following three improved varieties: Kenland red clover, Atlantic alfalfa, and Tift Sudan grass, for which it is estimated that there is an annual need for foundation seed of 150,000 lbs., 20,000 lbs., and 7,000 lbs., respectively. The following statement reflects the amount of foundation seed stocks produced in each crop year since the inception of the project, and the anticipated certified seed available for planting by farmers when the foundation seed has been projected through two generations of increase (4 years):

	Available Foundation Seed Supplies			Registered Seed,	Certified Seed,
	1948	1949	1950	1952	1954
	(All amounts shown are lbs.)				
Kenland red clover	500	7,148	100,000	1,500,000	15,000,000
Atlantic alfalfa	-	-	10,000	100,000	1,000,000
Tift Sudan grass	150	4,550	20,000	250,000	5,000,000

Ten years after Cumberland red clover, adapted to the same regions as Kenland, was introduced, the supply of certified seed had reached only 842,000 pounds under practices then followed, with a potential need of 40 million pounds.

4. State Marketing Service Programs. State departments of agriculture, bureaus of markets, and other agencies of 29 States and 2 Territories are carrying out 94 specific projects in the broad fields of expanding market outlets, collecting marketing information, and improving marketing efficiency.

Among examples of achievements in specific states are the following:

a. The Kansas preharvest wheat quality survey has become an important service for farmers and grain buyers throughout the state and has provided an accurate basis for marketing during the rush of the wheat harvest. During 1949 and 1950

results of State-wide surveys by counties were released about July 10th. Information on expected test weight, protein content and character of the wheat crop has placed producers of high quality wheat in a position to obtain premiums to which they were entitled and has enabled millers and other grain buyers to adjust their prices and purchases in accordance with location and supply of wheat of specific quality.

b. In Michigan, production estimates for principal fruits and vegetables were developed and issued at regular intervals prior to and during the harvest season. These reports broken down by local areas within the state provided information on condition and probable date of harvest of individual products. Similar outlook information for other producing states was included in the reports. Growers and shippers found new yield and condition information of great value as an aid to orderly marketing at the most favorable price obtainable.

c. A pilot operation has been undertaken in Crawford County, Wisconsin in which tests and supervision have been provided for the milk delivered to cheese plants and follow up tests made of grade and quality of cheese produced. Results to date indicate substantial improvement in the quality of both milk and cheese produced in the area and justify extending the work to other counties.

d. In Virginia, a service program to facilitate orderly marketing of grain and hay, especially at harvest time when an over supply exists, has resulted in a 20-fold increase for grain and a 50-fold increase for hay in the volume officially inspected. This has improved returns to producers and reduced procurement costs for purchasers.

5. Costs and Margins in Ginning Cotton by Cooperative Gin Associations. Uniform records have been obtained from 220 cooperative cotton gins in seven states for the 1947-48 and 1948-49 seasons. In addition, labor utilization schedules have been obtained from approximately 100 gins showing that ginning expenses per bale, particularly for labor, are high because gin plants are operated at less than half their potential capacity for about half of the ginning season. This suggests that the per bale costs of ginning could be materially reduced by temporarily storing part of the seed cotton during the peak harvesting period. The study also shows that charges made for ginning cannot be evaluated without also considering revenues from other operations such as merchandising cotton-seed and cotton. In many instances, a gin earns more by handling the seed from a bale of cotton than it does from ginning the cotton.

6. Effects of Freight Rate Differences. It has been found (a) that differences in freight rates among markets having a single source of supply are a major cause of geographic price differences, (b) that differences in freight rates are apparently a major cause of differences in spread between farm prices and wholesale prices in various markets, and (c) that differences in freight rates between competing sources of supply are a major factor in determining the relative share of a common market obtained by each source. An attempt is being made to develop methods for estimating the effect of simultaneous changes in production, market demand, freight rates, and other marketing charges. Such methods would be exceedingly valuable in estimating probable changes in the competitive position of supply areas arising from changes in freight rates, act as a guide to carriers in modifying rate policies, and constitute useful evidence to regulatory bodies and shippers in rate cases.

7. Introduction of Meat-Type Hogs and Improved Swine Carcasses for Commercial Distribution. Leaders in the livestock industry have felt the need of a new type hog that would yield a higher percentage of lean cuts and a lower percentage of fat cuts and lard. Progress has been impeded, however, by failure to use grade standards, "buying on averages" and refusal to recognize quality through the payment of premiums. Research on this subject clearly indicates that hog cut-out values are dependent on body length and thickness of back fat and that hogs yielding a high percentage of lean cuts are worth from 75 cents to $1.00 a hundred pounds more at current market prices than hogs yielding a high percentage of fat cuts. Tests are being continued in 1951 for the purpose of adding hogs of various grades and weights to the cut-out figures obtained in earlier years to insure that sufficient data are available to warrant the drawing of definite conclusions regarding practical ways for classifying hogs in accordance with their market value.

8. Costs of Manufacturing and Distributing Mixed Feed. A report showing that operating expense for 26 mills varied from $2.95 to $13.83 per ton and for 21 distributing associations from $.58 to $9.47 per ton is the only published data of this kind available. Managers have welcomed the opportunity provided to compare details of their operations with those of others. While unit expenses of small local mills are generally higher than those of large centralized plants, they are able to distribute feed direct from mill to farm. They thus avoid handling and transportation costs the larger mills must pay, and frequently can deliver feed to the farmer on his farm at less total cost than can their centralized competitors.

9. Western Apple Growers Share of Consumer's Dollar Varies Widely. The grower's share of the consumer's dollar spent for Washington Delicious apples in Chicago was 15.7 cents in December 1947, 35.4 cents in December 1948, and 7.3 cents in December 1949. Variations in "on-tree" prices for Washington Delicious apples were not reflected in proportionate changes in Chicago retail

prices for the fruit during October, November, and December of the 1947, 1948, and 1949 seasons. Analysis of data supplementing the 1947-48 study of farm-to-retail margins for Washington apples shows that in certain instances spreads between prices received by the grower and prices paid by consumers narrowed when farm prices rose and widened when they declined.

10. Wire Ties Reduce Damage to Lettuce Crates in Test Shipment. Contract research by the Western Growers Association has developed a more suitable container for shipping and marketing lettuce. In test shipments the new container suffers less in-transit breakage than the conventional crate and lettuce packed in it suffers considerably less bruising and crushing. A wire tie around the middle of the crate apparently could eliminate about $350,000 worth of in-transit damage yearly. Tests indicate that large savings can also be made in the amount of package ice used. Studies of ways to improve containers and reduce shipping losses for other perishable commodities are in progress.

11. Mechanically Refrigerated Railroad Car. A mechanical unit now used for refrigerating motor trucks was adapted by a private company (under contract) to provide one suitable for heating and cooling railroad refrigerator cars. Two experimental cars in the United States and one in Canada have undergone extensive tests over a year's time and have proved their reliability against breakdown and their ability to furnish non-fluctuating temperatures between 0° and 70°. Comparative costs indicate that the mechanical car may be operated at a lower cost than the standard refrigerator car for many commodities.

12. New Principles of Cleaning Cotton. The increased trash content of seed cotton resulting from mechanical harvesting has complicated the ginning process and has been a major handicap to increased use of mechanical pickers. Contract research has been concentrated on development of pneumatic (or air-blast) devices for cleaning seed cotton. Application has been filed for a patent on what has been called a "turbo-cleaner," which cleans cotton very satisfactorily in the laboratory. The practical application of the new process will be an important step toward solving the trash removal problem.

13. Cold Storage of Citrus for Offseason Marketing. Investigations extending over two years show that Florida Valencia oranges can be stored 3 months in good condition, that mid-season pickings have the best storage quality and that 32° storage was superior to 38° or higher temperatures. Commercial carlot storage in New York and Providence from May to August was successful and profitable to the grower, on the basis of sales at $2.00 to $3.00 per box higher than the average price of around $6.00 when placed in storage.

14. Plans for Improved Structures for Farm Grain Storage. In cooperation with the Midwest Plan Service (initiated by State agricultural experiment stations), 30 plans were prepared for farm grain storage buildings, including new type structures and provision for ready adaptation to forced ventilation and drying. Improved methods of anchoring grain bins and excluding storm water were incorporated. The plans have been widely distributed to farmers throughout the grain producing areas.

15. Mechanical Damage in Potato Storage and Shipping. The Red River Valley Potato Growers' Association completed construction of a 30,000 bushel experimental potato storage and shipping plant in November, 1949, and made it available to the Federal government for cooperative investigations with the Minnesota and North Dakota agricultural experiment stations, shippers, railroads, and others. Initial work shows that (a) most of the mechanical damage occurs in filling the potato storage bins, (b) that canvas instead of burlap sacks will prevent wind damage and decay during harvest, and (c) that more ice is used than needed in shipping potatoes in late summer and early fall. These findings point the way to reducing costs and improving quality in marketing potatoes.

16. Developing More Efficient Market Facilities. Studies have been made in more than 30 concentration, secondary, and terminal markets, in which facilities for handling fruits, vegetables, poultry, eggs, butter, meat, frozen foods and other commodities have been analyzed to determine the defects in handling methods and in the facilities being used, and to measure the amount that is added to the marketing cost because of such defects. These costs are measured for each commodity group as a basis for estimating the amount of savings that might be made by the construction of more efficient facilities and the adoption of more efficient handling methods. Based on these studies, recommendations have been made, where feasible, for improved marketing facilities and designs have been drawn up for the facilities recommended.

17. Reducing Retailing Costs. Through the application of time and motion study techniques, careful analyses have been made of the checking in, price marking, shelving and checking out of groceries in a sample of chain stores. The operations studied accounted for 50 percent of retail store labor. New procedures and services were developed, installed and tested in experimental stores with labor savings of 35 to 45 percent for the operations affected. The check-out stand developed as part of this work is reducing check-out costs from 28 to 43 percent. Widespread adoption of improved procedures and services appears to be assured by general interest among retail food stores, especially large organizations.

18. Marketing Education Developed in 43 States. State project leaders in 43 States and 3 Territories are carrying on 139 Extension projects. Results of research, educational material, and leaflets for general distribution were prepared and distributed to these leaders. Four conferences for demonstration of marketing work

and training of marketing leaders were held during the year. A regional project to broaden the market for hard winter wheat by special educational work with millers, bakers, and handlers in terminal markets was started this year. Regional educational projects on eggs in the North Central States and on livestock in the Western States are being developed. Three contracts for consumer education work are in effect in the New England, New York City, and Kansas City areas. Visual aids are being prepared for use at meetings by State and county extension workers in marketing.

19. Proper Temperature for Drying Grain. The safe drying temperature of grain was found to be related to the amount of moisture in the grain at time of drying. Feeding value of mature corn of relatively low moisture content was not adversely affected by drying temperatures up to 190 degrees F., but soft corn was affected adversely at 135 degrees F. and above. The safe range for soft corn appears to be between 95 degrees F. and 135 degrees F. Possible damages occurring below 95 degrees F. may be due to enzymatic spoilage occurring during very slow drying periods. Swine feeding tests on corn dried at temperatures up to 190 degrees F. showed no significant loss in feeding value in the presence of supplements of soybean and alfalfa meals which presumably correct any deterioration due to drying at these temperatures. Soft corn had a feeding value equal to that of mature corn when dried at a safe temperature before damage due to spoilage developed.

20. Producers and Distributors Improve Marketing Methods. State Extension Services help producers, processors, handlers, and retailers put into use the results of research by demonstrating and encouraging the adoption of improved marketing methods, new practices, and techniques that are economically sound. In 1950 there were 25 projects on fruit and vegetable marketing, 4 on retailer training, 24 on poultry and eggs, 23 on livestock and wool, 10 on dairy, 13 on grain and seeds, 5 on cotton, 3 on forest products, and 5 on other farm products. In Indiana, 500 retailers took a training course in produce marketing, and consumer clinics were popular. In Pennsylvania, egg producers and handlers were assisted in developing a marketing program to give producers financial incentive to market properly sized and cleaned eggs. In Alabama, 65 commercial dressing plants were established to handle the expanding broiler industry. Several states are giving assistance to management of dairy processing plants to improve efficiency and maintain quality, also to develop the market for dried milk. Improving seasonal distribution of cattle marketings is under way in 11 States. Marketing hogs according to live-animal or carcass grades i developing in 7 States.

Advisory Committees:

Agricultural Research Policy Committee. The Agricultural Research Policy Committee met quarterly during the fiscal year 1950 in accordance with section 301 of the Research and Marketing Act. During the year the Committee gave special consideration to nutrition marketing research in

the fields of transportation, costs and margins, and the application of research results, and made policy recommendations pertinent to these fields of work. They also gave a careful review to the experience obtained during the first three years in the operations of advisory committees established on a commodity and functional basis. On the basis of this review, they made recommendations concerning ways and means of improving the operation of the committee system and suggested that the chairmen of all committees meet with the Policy Committee to develop a more mutual understanding of common problems and means of improving the effectiveness of committee functioning. Such a meeting was held in June and proved to be exceedingly helpful. The Committee also gave special consideration to the experience of the Department in the use of the contracting authority under the Research and Marketing Act. During the fiscal year 1950 there were four new members added to the Committee, replacing former members.

Commodity and Functional Advisory Committees: During 1950 there were 20 meetings of the commodity and functional advisory committees, all committees except the Wool Committee having met at least once. The committees reviewed the programs under way and made many recommendations for changes, additions, and deletions in the work program.

In June of 1950 the chairmen of all RMA advisory committees, including representatives of State agency committees, met to consider ways and means of improving the operations of the committee system and numerous recommendations were made. Foremost among them were the need for extending the committee review to the total research program of the Department, the need for more frequent meetings, and the need for more adequate service from the departmental staff.

The splendid attendance record of committee members at these meetings, the extent of the preparations made by many members for the meetings, and the keen interest evidenced during the committee sessions, all combined to make a very successful year of committee operations.

Research and Service Contracts. Authority to contract with agencies outside of the Department for research and marketing services provides a means whereby the resources of private and other public research and marketing service organizations may be brought to bear on the agricultural problems which require additional knowledge for their solution. As provided in the Act, research and service contracts are used where the work can be carried out more effectively, more rapidly, or at less cost than if performed by the Department. All contract work is supplemental to and coordinated with research and service work conducted by the Department. In the fiscal year 1950, 44 such contracts and 12 amendments were executed under Title II totaling $667,894.

Further data on these contracts, including the project under which the contract was let, contractor, contract objective and amount are as follows:

Research and Service Contracts,
Fiscal Year 1950 (Title II)

Proj. No.	Project Title and Objective of Contract	Contractor	Amount
2	Development of foreign outlets for U. S. agricultural products and study of foreign competition with such products (OFAR)		
	Objective of contract: To determine the future trend in cattle production in Canada, and, considering Canadian requirements, to estimate probable movement to the U. S. for the next five years.	C. L. Harlan Arlington, Va.	$5,900
	Objective of contract: To determine the long-time market aspects for U. S. dried fruits and the present and potential competition from other countries, faced by U. S. industry.	H. R. Wellmann Univ. of California Berkeley, Calif.	2,500
33	Price, demand, supply and consumption analysis for agricultural commodities. (BAE)		
	Objective of contract: To analyze supply and demand interrelationships in agriculture that will provide statistical measurements of these relationships.	Univ. of Chicago Chicago, Ill.	9,500
44	Prepackaging of perishable horticultural products. (PMA)		
	Objective of contract: To develop efficient methods of prepackaging fresh apples at shipping point and study costs of packaging and distributing prepackaged apples in comparison with bulk apples.	Washington State Apple Advertising Commission Yakima, Wash.	25,000
	Objective of contract: To test salability of fresh fruit packaged in different size, type and design containers.	Baer Brothers, Inc. Hagerstown, Md.	5,000
	Objective of contract: To determine comparative cost of prepackaging fresh cherries at shipping point by different methods and in comparison with bulk cherries.	Washington State Fruit Commission Yakima, Wash.	7,500

Proj. No.	Project Title and Objective of Contract	Contractor	Amount
55	Improving the effectiveness of wholesale market news services.(PMA)		
	Objective of contract: To develop more efficient methods of securing, analyzing and preparing marketing information for dissemination; to develop improved techniques for measuring the effectiveness of various media for disseminating agricultural marketing information; and to determine the relative effectiveness and cost of various media and methods of disseminating marketing information.	Iowa State College of Agricultural and Mechanic Arts, Ames, Iowa	10,000
70	Improving market outlets for various kinds of cotton in relation to merchandising procedures.(PMA)		
	Objective of contract: As an aid in determining suitability of varieties of commercial cotton for use in specific products to provide for spinning and weaving tests designed to indicate manufacturing waste, processing performance, and product quality.	Clemson College, Clemson, S. C.	19,000
71	Developing improved equipment and techniques for ginning and associated processes to minimize losses and increase salability of cotton and cottonseed.(PMA)		
	Objective of contract: As an aid in developing new and more effective methods of cleaning mechanically harvested cotton prior to ginning, to provide for studies of selected unexplored methods of cleaning seed cotton.	Battelle Memorial Institute Columbus, Ohio	14,000
84	Merchandising products marketed by horticultural cooperative associations.(FCA)		
	Objective of contract: To transfer sales data for the 1948-49 and 1949-50 fiscal years from office records of the contractors to FCA schedules.	St. Cloud Canning Association St. Cloud, Minnesota	100

Proj. No.	Project Title and Objective of Contract	Contractor	Amount
84	Continued	Texsun Citrus Exchange Weslaco, Texas	800
		Tri-Valley Packing Assn. San Francisco, Calif.	1,400
		Berks-Lehigh Cooperative Fruit Growers Fleetwood, Pa.	175
		Keystone Cooperative Grape Assn. North East, Pa.	250
		Turlock Cooperative Growers Modesto, Calif.	450
		Miscellaneous open market orders (not exceeding $500) Total (14)	2,640
93	Skirting and sorting wool at ranches, concentration points, and warehouses. (PMA)		
	Objective of contract: To increase returns to producers by improving preparation and processing of wool.	National Wool Marketing Corp. Boston, Mass. Charles Redd LaSalle, Utah Sieben Livestock Company Helena, Montana Hughes Livestock Company Stanford, Montana	3,000

Proj. No.	Project Title and Objective of Contract	Contractor	Amount
106	Improving distribution methods and practices in the handling of foods. (PMA)		
	Objective of contract: To acquaint retailers through short training courses with effective merchandising practices for fresh fruits and vegetables.	United Fresh Fruit and Vegetable Assn. Washington, D. C.	100,000
	Objective of contract: To acquaint retailers through short training courses with effective merchandising practices for poultry and poultry products.	Poultry and Egg National Board Chicago, Ill.	20,000
110	Effects of new oilseeds and fats and oils processing techniques on the industry, market outlets and returns to growers. (PMA)		
	Objective of contract: To evaluate the economic effects that any major shifts in the present processing methods have on the cottonseed industry, market outlets and returns to growers.	Texas A and M College College Station, Texas	1,000
120	Analysis of cooperative grain dealers' margins and costs. (FCA)		
	Objective of contract: To collect data from a selected group of farmers' cooperative elevators in order that such data may be analyzed for the purpose of segregating and appraising the factors that tend to increase or decrease costs.	The Kansas Farmers Service Assn. Hutchinson, Kansas	300
		Kansas Farmers Union Coop. Audit Assn. Salina, Kansas	420
		Farmers Grain Dealers Assn. of Iowa Des Moines, Iowa	720

Proj. No.	Project Title and Objective of Contract	Contractor	Amount
126	Introduction of meat type hogs and improved swine carcasses for commercial distribution.(FCA)		
	Objective of contract: To determine through yield and cut-out tests what cash premiums are justified for meat type hogs and to develop methods of reflecting premiums to producers.	Shen-Valley Meat Packers, Inc. Timberville, Va.	2,000
133	A study of adequacy of grades and standards.(BAE)		
	Objective of contract: Research and statistical methods for sensory difference tests of food quality.	Virginia Agricultural Experiment Station Blacksburg, Va.	15,000
163	Measurement of costs and margins in marketing farm products.(BAE)		
	Objective of contract: Study of marketing costs and practices for dry edible beans and peas.	Alderson and Sessions 1905 Walnut St. Philadelphia, Pa.	40,672
	Objective of contract: Study of marketing costs and practices, fresh fruits and vegetables in Cleveland.	Industrial Surveys Co. 425 N. Michigan Ave. Chicago, Ill.	29,500
	Objective of contract: To determine the marketing costs and practices in marketing farm products through public eating places in Minnesota.	Minnesota Agricultural Experiment Station St. Paul, Minn.	5,500
	Objective of contract: Study of the effects of governmental control on costs of marketing milk and on price spreads.	Ohio Wesleyan University Delaware, Ohio	7,500
167	Reduction of waste through improved packaging materials and loading techniques.(PMA)		

Proj. No.	Project Title and Objective of Contract	Contractor	Amount
167	Continued		
	Objective of contract: To develop basic data on the effects of various types of refrigerator cars, rail routing, loading methods and patterns upon the relative amounts of in-transit-damage suffered by rail shipments of dressed beef.	Railroad Perishable Inspection Agency New York, N. Y.	1,000
	Objective of contract: To develop basic data relating to the particular type and degree of shock and vibration associated with damage to rail shipments of dressed beef and shell eggs during transportation, the particular points in transit at which such damage-producing shocks and vibrations occurred and to work with railroads, shippers, refrigerator car lines and other interested groups to develop improved equipment and handling methods to reduce in-transit damage to these commodities.	North American Car Corporation Chicago, Ill.	9,000
	Objective of contract: To determine causes of excessive damage in the transportation of cantaloupes and celery from central California shipping districts to consuming markets, and to determine through tests of various loading and bracing methods how loss and damage may be reduced.	Western Growers Assn. Los Angeles, California	25,000
168	Transportation costs and their economic effects on agriculture. (BAE)		
	Objective of contract: Study of trade barriers in the State of Wisconsin.	Wisconsin Agricultural Experiment Station Madison, Wisc.	9,000
205	General economics of marketing.		
	Objective of contract: Study of pricing policies in the tobacco industry.	Vanderbilt Univ. Nashville, Tenn.	27,000

Proj. No.	Project Title and Objective of Contract	Contractor	Amount
205	Continued		
	Objective of contract: To analyze the marketing methods of negro farmers in the sale of specified farm commodities in selected areas of Louisiana.	Southern Univ. Baton Rouge, La.	27,000
	Objective of contract: To analyze particular marketing problems relating to Northeastern agriculture.	Harvard Univ. Cambridge, Mass.	18,000
	Objective of contract: To examine and test for a selected group of families the psychological approach in explaining consumer buying behavior with the particular objective of determing the value of this approach in improving the measurement of consumer demand for farm products.	Connecticut Univ. Storres, Conn.	2,200
	Objective of contract: Futures-trading research on organized exchanges in selected agricultural commodities.	Brookings Institution 722 Jackson Pl, N. W. Washington, D. C.	62,500
233	Development of new and improved methods for grading oilseeds and oilseed products and analysis of relationships of oilseed grades to out-turn and quality of oilseed products.(PMA)		
	Objective of contract: As an aid in the development of a practical method of grading small lots of cottonseed as sold by producers, to initiate and conduct exploratory studies of methods of oil determination.	Battelle Memorial Institute Columbus, Ohio	10,000
252	Field study on preparation of wool for marketing through cooperatives. (FCA)		
	Objective of contract: To compare and measure the efficiency of core sample shrinkages as obtained from samples taken from wools packed to different degrees of density.	National Wool Marketing Corporation 281 Summer St. Boston, Mass.	4,000

Proj. No.	Project Title and Objective of Contract	Contractor	Amount
252	Continued		
	Objective of contract: To compare the results of shearing pen and terminal market warehouse grading, and measure the effect on net wool sales returns on consigned cooperatively marketed wools.	National Wool Marketing Corporation 281 Summer St. Boston, Mass.	2,000
382	Development of new and expanded market outlets for oilseeds, animal fats and their products. (PMA)		
	Objective of contract: To analyze the existing and potential market outlets for fats and oils of domestic agricultural origin in the fields of fatty acids and their products, especially synthetic detergents and emulsifiers used in edible fats and oils products.	John W. McCutcheon New York, New York	7,500
	Objective of contract: To conduct research on the processing, packaging and marketing of new peanut products developed by the contractor in order to expand the outlets of peanuts.	Georgia Experiment Station Experiment, Georgia	5,000
389	Survey of marketing of fruits, fruit products, and tree nuts.		
	Objective of contract: To conduct surveys on consumer purchases of selected fruits and fruit products. (BAE)	Industrial Surveys Co. 425 N. Michigan Avenue Chicago, Ill.	71,500 1/
	Objective of contract: In cooperation with industry groups, to provide data on availability (percentage of stores handling) of selected fresh fruits, canned and frozen juices, and dried fruits and data on retail store inventory of certain dried fruits: (1) to aid growers, packers, processors, and distributors in planning the marketing of their supply in a more orderly manner, (2) to facilitate	Industrial Surveys Co. 425 N. Michigan Avenue Chicago, Ill.	11,000 2/

Proj. No.	Project Title and Objective of Contract	Contractor	Amount
389	Continued		
	Objective of contract - Continued more productive sales effort by all elements of the industry, thereby increasing total sales, and (3) to improve merchandising efforts for these products.(PMA)		
419	Using farm cooperatives in testing new equipment and developing improved procedures to reduce specific citrus margins and handling costs.(FCA)		
	Objective of contract: To develop and test on a commercial scale elevator loaders for use in the grove and packinghouse, to conduct a complete commercial sized operation of field loading, transporting, unloading and coloring citrus fruit in bulk, to prepare plans, drawings and instructions on the use of bulk handling equipment, to make a cost analysis of commercial scale bulk operations and to determine the savings that can be made by handling citrus fruit in bulk.	Agricultural Experiment Station Univ. of Florida Gainesville, Fla.	15,000
438	Practices, methods, costs and margins in ginning cotton by cooperative gin associations.(FCA)		
	Objective of contract: To collect data from which analyses may be made of methods, practices, size of operation and other factors as they affect costs and margins of cooperative gins; to determine the extent to which costs and margins can be reduced.	14 Miscellaneous open market purchase orders (not exceeding $500 each)	1,367
550	Meeting dairy market sanitation and health requirements most economically. (BAE)		
	Objective of contract: Study of milk handling arrangements as means of improving and lowering costs of marketing fluid milk.	Doane Agricultural Service 5144 Delmar Blvd. St. Louis, Mo.	30,000

Total of Research and Service Contracts, 1950, Title II	667,894

1/ In addition, cooperators contributed $41,450.

2/ In addition, $10,000 was contributed by the Citrus and Dried Fruit Industries.

UNITED STATES DEPARTMENT OF AGRICULTURE
RESEARCH AND MARKETING ACT, TITLE II

TABLE I

Agency Summary of Obligations under Title II Research and Marketing Act Allotments, Fiscal Years 1950 Actual, 1951 and 1952 Estimated

Agency	Direct Work (Other than Contracts)			Contracts			Total		
	1950 Actual	1951 Estimated	1952 Estimated	1950 Actual	1951 Estimated	1952 Estimated	1950 Actual	1951 Estimated	1952 Estimated
BAE	$958,462	$980,000	$904,500	$354,872	$245,000	$240,000	$1,313,334	$1,225,000	$1,144,500
OES	303,144	311,000	286,000	- -	- -	- -	303,144	311,000	286,000
BHNHE	10,126	10,000	10,000	- -	- -	- -	10,126	10,000	10,000
BAI	26,159	25,000	25,000	- -	- -	- -	26,159	25,000	25,000
BDI	24,818	25,000	25,000	- -	27,000	- -	24,818	52,000	25,000
BPISAE	357,347	356,000	321,000	- -	5,000	- -	357,347	361,000	321,000
BEPQ	87,188	100,000	95,000	- -	- -	- -	87,188	100,000	95,000
FS	39,551	44,000	44,000	- -	- -	- -	39,551	44,000	44,000
PMA	2,326,411	2,257,000	2,136,500	273,000	276,000	259,000	2,599,411	2,533,000	2,395,500
FCA	209,206	210,000	188,000	31,622	22,000	21,000	240,828	232,000	209,000
EXT	569,097	624,000	569,000	- -	75,000	80,000	569,097	699,000	649,000
OFAR	194,208	180,000	140,000	8,400	- -	- -	202,608	180,000	140,000
ADMIN., ARA	103,173	125,000	121,000	- -	- -	- -	103,173	125,000	121,000
Staff Offices:									
SEC	3,978	4,000	4,000	- -	- -	- -	3,978	4,000	4,000
SOL	3,484	5,000	5,000	- -	- -	- -	3,484	5,000	5,000
INF	28,350	26,000	26,000	- -	- -	- -	28,350	26,000	26,000
Total	5,244,702	5,282,000	4,900,000	667,894	650,000	600,000	5,912,596	5,932,000	5,500,000

UNITED STATES DEPARTMENT OF AGRICULTURE
RESEARCH AND MARKETING ACT, TITLE II

TABLE II

Commodity Summary of Obligations under Title II Research and Marketing Act Allotments, Fiscal Years 1950 Actual, 1951 and 1952 Estimated

Commodity	Direct Work (Other than Contracts)			Contracts			Total		
	1950 Actual	1951 Estimated	1952 Estimated	1950 Actual	1951 Estimated	1952 Estimated	1950 Actual	1951 Estimated	1952 Estimated
General	$3,248,149	$3,274,400	$2,992,400	$306,772	$350,000	$375,000	$3,554,921	$3,624,400	$3,367,400
Cotton	138,725	138,000	117,000	34,367	25,000	3,000	173,092	163,000	120,000
Dairy	171,192	185,250	193,500	30,000	58,750	37,000	201,192	244,000	230,500
Fats and Oils	210,225	217,500	196,500	23,500	42,000	20,000	233,725	259,500	216,500
Field Crops	422,840	385,200	382,700	1,440	10,000	17,000	424,280	395,200	399,700
Forest Products ..	49,151	50,000	50,000	- -	- -	- -	49,151	50,000	50,000
Fruits and Vegetables	362,869	382,250	343,500	260,815	122,250	117,000	623,684	504,500	460,500
Livestock	124,398	114,700	106,700	2,000	26,000	16,000	126,398	140,700	122,700
Potatoes	72,348	75,000	68,500	- -	- -	- -	72,348	75,000	68,500
Poultry	144,975	166,200	156,200	- -	16,000	15,000	144,975	182,200	171,200
Sugar	51,302	42,500	45,000	- -	- -	- -	51,302	42,500	45,000
Tobacco	48,436	48,000	48,000	- -	- -	- -	48,436	48,000	48,000
Wool	65,132	37,000	34,000	9,000	- -	- -	74,132	37,000	34,000
Over-all administration	134,960	166,000	166,000	- -	- -	- -	134,960	166,000	166,000
Total	5,244,702	5,282,000	4,900,000	667,894	650,000	600,000	5,912,596	5,932,000	5,500,000

TABLE III

UNITED STATES DEPARTMENT OF AGRICULTURE
RESEARCH AND MARKETING ACT, TITLE II

Functional Summary of Obligations under Title II Research and Marketing Act Allotments, Fiscal Years 1950 Actual, 1951 and 1952 Estimated

	1950 Actual	1951 Estimated	1952 Estimated
I. Basic data and information			
a. Reports on supplies, prices, and movement of farm products	$251,614	$257,700	$230,700
b. Improving market news and other market information services	195,690	149,200	133,700
c. Promoting greater use of market information through State educational and service agencies	247,342	235,000	214,000
Total, Financial Project I	694,646	641,900	578,400
II. Expansion of outlets for farm products			
a. Development of foreign outlets	212,986	190,000	145,000
b. Exploring opportunities for expanding domestic markets	214,067	206,000	162,000
c. Determining consumer preferences	222,568	218,600	138,600
d. Consumer education	103,061	104,400	104,000
e. State service programs to expand market outlets	367,440	435,000	390,000
f. Analyses of supply, demand, and consumption	130,075	123,500	117,700
Total, Financial Project II	1,250,197	1,277,500	1,057,300

Functional Summary--Continued

	1950 Actual	1951 Estimated	1952 Estimated
III. Marketing services, costs, and margins			
a. Analyses of marketing services	115,225	150,100	137,600
b. Studies of pricing practices	34,998	38,500	46,000
c. Measurement of costs and margins	496,208	474,300	512,800
Total, Financial Project III	646,431	662,900	696,400
IV. Improvement in preparation and handling of farm products			
a. Development and improvement of grades and standards ..	471,139	480,100	407,100
b. Developing improved containers and methods of packaging	179,537	130,200	163,200
c. Improving transportation services and equipment ...	117,631	127,100	126,100
d. Economic studies of new and improved processing methods	230,519	245,100	224,100
e. Improved storage and conditioning of farm products	416,165	426,300	366,300
f. Quality preservation in marketing channels	205,699	216,000	183,500
Total, Financial Project IV	1,620,690	1,624,800	1,470,300
V. Evaluation and improvement of marketing system			
a. Improvement in physical plant	269,798	260,000	244,500

Functional Summary--Continued

	1950 Actual	1951 Estimated	1952 Estimated
V. Evaluation and improvement of marketing system--Continued			
b. Increasing efficiency of merchandising agricultural products	388,940	336,400	390,400
c. Evaluation of market organization	383,240	307,900	285,700
d. Improving marketing methods and efficiency through State educational and service programs	523,694	654,600	611,000
Total, Financial Project V	1,565,672	1,558,900	1,531,600
Over-all Administration ..	134,960	166,000	166,000
TOTAL, TITLE II	5,912,596	5,932,000	5,500,000

BUREAU OF AGRICULTURAL ECONOMICS

Purpose Statement

The Act which established the Department of Agriculture in 1862 described its duties in part as follows: "to acquire and diffuse among the people of the United States useful information on subjects connected with Agriculture, in the most general and comprehensive sense of that word***". It also provided specifically for the "collection of statistics." A small beginning had been made on statistical work in the Patent Office and this work was taken over by the Department of Agriculture when it was established. The issuance of regular crop reports has continued ever since, the scope and coverage being increased from time to time by Congress.

On July 1, 1922, the present Bureau of Agricultural Economics was formed by the consolidation of the former Bureaus of Markets and Crop Estimates and the Office of Farm Management and Farm Economics. The duties and responsibilities of this Bureau have been modified from time to time by law and by Secretary's directives. As now constituted, the Bureau of Agricultural Economics is the chief economic research and statistical agency of the Department of Agriculture. As a service agency, it supplies the Secretary's Office, other agencies, congressional committees, industry groups, and the public with statistical data and economic analyses relating to current and proposed Department programs and activities. As a staff agency, it is responsible for the coordination or general supervision of statistical matters and economic research throughout the Department. It acts as liaison agency with the Bureau of the Budget in the administration of the Federal Reports Act.

Two subappropriations provide for work as follows:

Economic Investigations: Research is conducted and information furnished on production and distribution of commodities; land utilization and conservation; farm management methods and practices; land ownership and values; utilization of farm products; purchasing of farm supplies; farm population, farm labor; farm finance, insurance, and taxation; adjustments in production to probable demand; costs, prices, and income in their relation to agriculture, including causes for variations and trends. Much of this work is performed in the field in cooperation with the Land Grant Colleges and other State institutions.

Crop and Livestock Estimates: Basic statistical and economic data relating to food and agriculture are gathered, analyzed and published, including acreages, yields, and production, stocks, values and utilization of farm crops; numbers, production, value and utilization of livestock and livestock products; and such related data as prices received and prices paid by farmers. Thousands of farmers, processors, merchants, and others serve as volunteer reporters and these reports are supplemented by field observations of the Bureau's statisticians and other data to provide the many estimates and reports issued for public information.

The Bureau's central office is in Washington, D. C., with program activities carried on from 41 State offices (covering crop estimating and other statistical work in all States). Cooperative work is being carried on with Land Grant Colleges or other State institutions in every State in the Union.

On November 30, 1950, the Bureau had 1,477 employees, of whom 740 were in Washington and 737 in the field.

	Estimated, 1951	Budget estimate, 1952
Appropriated funds	$5,439,000	$5,395,000

Summary of Appropriations, 1951 and Estimates, 1952

Item	Total estimated available, 1951	Budget estimates, 1952	Increase (+) or decrease (-)
Salaries and Expenses:			
Economic investigations	$2,535,000	$2,529,000	-$6,000
Crop and livestock estimates	2,904,000	2,866,000	-38,000
Total, direct annual appropriation	5,439,000	5,395,000	-44,000

Salaries and Expenses

	Economic Investigations	Crop and Livestock Estimates	Total
Appropriation Act, 1951	$2,600,000	$2,904,000	$5,504,000
Reduction pursuant to Section 1214	-65,000	- -	-65,000
Base for 1952	2,535,000	2,904,000	5,439,000
Budget Estimate, 1952	2,529,000	2,866,000	5,395,000
Decrease	-6,000	-38,000	-44,000

SUMMARY OF INCREASES, 1952

Economic Investigations:

Net decrease consisting of decrease of $6,800 due to providing a direct appropriation to the General Services Administration for certain procurement and leasing costs previously paid from this appropriation offset, in part, by an adjustment of $800 to round-off the estimate ..... -$6,000

Crop and Livestock Estimates:

Decrease due to providing a direct appropriation to the General Services Administration for certain procurement and leasing costs previously paid from this appropriation ..... -38,000

PROJECT STATEMENT

Project	1950	1951 (estimated)	Adjustments	1952 (estimated)
1. Economic investigations:				
(a) Economics of production	$1,367,112	$1,341,000	-$4,000	$1,337,000
(b) Prices, income and marketing	986,229	977,000	-2,000	975,000
(c) Farm population and manpower	245,970	217,000	- -	217,000
(d) Farm housing and construction	15,000	- -	- -	- -
Subtotal	2,614,311	2,535,000	-6,000	2,529,000
2. Crop and livestock estimates:				
(a) Field crop estimates and reports ..	858,145	902,000	-12,000	890,000
(b) Fruit, nut, and vegetable estimates and reports	379,002	397,000	-5,000	392,000
(c) Livestock and poultry estimates and reports	493,044	517,000	-7,000	510,000

(Continued on next page)

Project	1950	1951 (estimated)	Adjustments	1952 (estimated)
2. Crop and livestock estimates: Cont.				
(d) Dairy estimates and reports	$322,509	$338,000	-$4,000	$334,000
(e) Agricultural price estimates and reports	449,564	603,000	-8,000	595,000
(f) Farm surveys and employment estimates and reports	173,869	147,000	-2,000	145,000
(g) Farm housing and construction	141,680	- -	- -	- -
Subtotal	2,817,813	2,904,000	-38,000	2,866,000
Unobligated balance	76,799	- -	- -	- -
Total available	5,508,923	5,439,000	-44,000	5,395,000
Transfer in 1951 Estimates from:				
"Research and Marketing Act of 1946, Department of Agriculture"	-552,208	- -		
"Salaries and expenses, Farm Housing, Department of Agriculture"	-156,679	- -		
"Special research fund, Department of Agriculture"	-54,136	- -		
Reduction pursuant to Section 1214	- -	+65,000		
Total appropriation or estimate	4,745,900	5,504,000		

CHANGE IN LANGUAGE

The estimates include a proposed change in language of this item as follows (new language underscored; deleted matter enclosed with brackets):

Preamble

For necessary expenses in carrying out the provisions of the Act establishing the Bureau of Agricultural Economics ([5 U.S.C. 673] 7 U.S.C. 411) and related Acts, as follows:

The purpose of this change is to correct the code citation included in the 1951 Act pertaining to the establishment of the Bureau of Agricultural Economics.

STATUS OF PROGRAM

Current Activities

Work performed in the Bureau is directed toward (1) Economic Investigations which include the collection, analysis, interpretation, and publication of current and historical research information concerning economic aspects of American agriculture, and (2) Crop and Livestock Estimates which provide basic statistical data on production, consumption, stocks, prices, trends and related information affecting farm crops and livestock. Current emphasis in these fields reflects increasing attention to defense factors affecting the agricultural economy.

Selected Examples of Recent Progress:

Economic Investigations

Economics of Production:

1. Volume of farm output in 1950 was somewhat smaller than the 1948 and 1949 records, but 35 percent above 1935-39. The effects of various technological developments on production are being analyzed and index numbers of farm output for each State are being computed. United States index numbers of farm output by groups of commodities are also being prepared. Output per man-hour has increased more rapidly than total output, as total labor requirements on farms have declined (Figure 1).

2. Annual estimates of labor requirements in farming indicate that about 19.4 billion man-hours of labor were required on farms in the United States in 1949. Preliminary estimates for 1950 indicate a decline of about 5 percent below 1949 to a record low, partly because of the very small cotton crop harvested in 1950. Total man-hours of farm work required in production of cotton, wheat, and corn, and to care for horses and mules have decreased considerably since 1920, even though the volume of farm production for most products is higher, and in total is materially higher (Figures 2 and 3).

3. As a part of continuing analyses of progress and extent of farm mechanization, data were developed during the year on the influence of size, age, and type of tractor on fuel consumption, and the annual hours of tractor use. Tractors consume over 40 percent of liquid petroleum fuels used on farms, and tractor fuel is now one of the essential farm supply items. Average use of farm tractors increased from about 400 hours in 1920 and 1930 to about 500 hours of use in 1940 and about 590 hours in 1947.

4. Economic studies of mechanical cotton harvesters indicate that the cost of operating the machine is considerably less than the cost of hand picking. But mechanical picking results in lower grade cotton and greater field waste. Better ginning equipment and better operating efficiency with more experience by machine operators promise to reduce these losses. Based on price relationships of the last few years each machine should pick 100 bales or more per season for it to be significantly more economical than hand harvesting. In California the cost of harvesting with a cotton picker was $26 per bale, including allowances for field waste and grade loss. Cost of picking the same cotton by hand would have been $45 per bale.

5. Results of studies of economics of farm electrification indicate that the amount of electric power used on farms is determined largely by the length of time the farm has been electrified, by the amount of farm income, and by the kind of farm enterprises. Dairy and poultry enterprises are particularly heavy users of electricity. These relationships are apparent in comparison of farm use of electricity from 1938 to 1947 in Western Washington, Eastern Iowa, and the Piedmont of Georgia, three areas where these studies were completed during the year (Figure 4). In the Georgia area 90 percent of the electricity was used for farm household purposes, in the Iowa area about 80 percent was so used, but in the Washington area only 65 percent.

6. Estimates of production, income and costs on 15 types of farms in 7 major farming regions were prepared and published for 1949. For the first time since 1941 farm returns in 1949 began to decline generally on these 15 important types of commercial family-operated farms. Preliminary results for 1950 indicate reductions below 1949 on cotton and dairy farms, and income increases on wheat and Corn Belt farms (Figures 5 and 6).

7. Cooperative studies with State Experiment Stations were continued on problems of organization and operation of farms in different type of farming regions. For example:

   (a) Ways and means of assisting farmers to adopt improved farming systems were studied in Western North Carolina. Nearly 40 percent of the commercial farms in the area had 30 acres or less of open land and only 10 percent of the farms had more than 80 acres of land. The resources on these farms are too limited to produce acceptable incomes. However, incomes can be increased by improving pasture and adding dairy cows. The most profitable system appears to be a pasture-livestock system with about one acre of burley tobacco handled by family labor as an important cash crop.

   (b) A study of sugar beet mechanization indicates that mechanical beet harvesters are lowering production costs materially and increasing the comparative advantage of sugar beets, especially on irrigated farms with 20 to 25

acres or more of beets. Mechanization of thinning and blocking operations will further reduce costs and increase the advantage of beets over other row crops.

(c) The economic costs and advantages of increasing the production and utilization of farm-grown feeds was studied in 6 areas. In Western Kansas, for example, the findings show that it would be difficult on the smaller farms to develop efficient feed crop enterprises. If arrangements could be made, it would be more profitable to use excess wheat acres for producing wheat to be fed on the farm rather than to put a limited acreage in grass. On larger farms that have access to stock water, even though grass and grazing enterprises involve larger investments, they are feasible alternatives to wheat. The study provides wheat farmers with a guide as to the relative investments and returns that may be expected with different kinds of forage and grazing enterprises.

8. The structure of current American agriculture is so complex that a better understanding of the kinds and sizes of farms in the United States is needed in appraising agricultural changes and present conditions. An economic classification of farms was developed from the 1945 census in cooperation with the Bureau of the Census. About 4,270,000 of the 5,860,000 farms reported in the 1945 census were operated to provide a livelihood for the farmer and his family, and can be characterized as farming units. But in many regions, small part-time farms and rural residences are numerous. About 1,590,000 or slightly more than one-fourth of all farms, were classified as part-time and nominal units. The proportion of farms so classified varies from nearly 40 percent in the Northeast to less than 10 percent in the Northern Plains. The farming units cover a wide range of economic conditions and scale of operations. About 100,000 were classified as large-scale units. Commercial family farms, with a total value of production ranging from $1,200 to $20,000 accounted for about 55 percent of all farms and more than 70 percent of the gross value of all farm products. In addition there were nearly one million small-scale farming units reporting a value of products between $500 and $1,200 (Figure 7).

9. Farm land values set a new record in November 1950. After a gradual downward trend during 1949, land values began to rise moderately in early 1950, with a marked advance after the outbreak of hostilities in Korea. The United States index for November 1950 was 179 (1912-14=100), about one percent above the previous peak reached in November 1948 and 5 percent above the high reached in 1920. The November level was up 7 percent from the previous year and up 4 percent from July. The largest increase since July occurred in the North Central group of States. The volume of voluntary sales of farms for the year ended last March was about 9 percent below the previous year and at a level

about midway between prewar and the 1946-47 peak of sales activity. Around two-fifths of the farms bought are being purchased for cash. Down payments on credit-financed sales average between 45 and 50 percent of the purchase price (Figures 8 and 9).

10. Total rental payments for farm property declined in 1949 for the second consecutive year. Gross rent (including government payments received by landlords) totaled 2,727 million dollars, down 12 percent from 1948. Cash rents continued to increase slightly but the value of share rents was substantially below the previous year, reflecting the decline in prices received for agricultural products in 1949, especially grain crops. Landlords' expenses, consisting principally of taxes, insurance, and building repairs and depreciation, were substantially unchanged. Net rents were estimated at 1,630 million dollars, or 19 percent less than in 1948. The ratio of net rent to the value of leased land dropped to 6.8 percent, compared with 8.2 percent in 1948. Preliminary indications are that the value of gross rents in 1950 will be up about 7 percent from 1949, with net rents increasing as much as 15 percent and a ratio of net rent to value somewhat above 7 percent.

11. The Bureau's land use inventory disclosed a net increase between 1944 and 1949 of 7 million acres of land used for crops, including cropland harvested, crop failure and fallow. This increase was brought about by the release of land from military use, from development of water supplies in arid areas, drainage of wet land, and clearing woodland and brush and more conservation measures on existing farms. Even with the increase in population, the acreage of cropland harvested that was used for domestic production remains slightly over 2 acres per capita, and open or nonforest pasture about 4 acres. While land use changes are small percentage-wise, they perhaps are indications of an upward turn in acreages used for crops and pasture. Furthermore, inquiries on land inventory, classification, and related surveys show greater interest by farmers and the public generally in the continued development of land potentially available for agricultural production. A map was completed showing the major uses of land in the United States to help supply the need for information on this subject.

12. Farmers are developing about 1½ million acres of new land per year by clearing, drainage, and irrigation. Costs of new land development are much higher now than in 1940. Clearing costs in several areas range from $25 to $100 per acre, depending on the nature of the job; drainage costs for new land areas from $10 to $50; while irrigation costs (to the farmer) for new land generally range over $100 per acre. More land is available for development for farming but much of it is less productive, or more costly to develop than the land now in cultivation. Accordingly, careful appraisals are necessary to prevent unwise public and private investment in land development undertakings.

A number of studies have been made in specific areas to appraise the opportunities for land development and settlement: for example, a field study of methods and costs of extensive land clearing in Northeast Arkansas. A summary report is being prepared covering development problems for the entire alluvial valley of the Lower Mississippi River.

13. Research work in water utilization has been concerned primarily with selected phases of river basin programs. An analysis of irrigation project proposals in the Missouri Basin indicates that 7 million acres of land could ultimately be provided with water, 5 million under new irrigation and 2 million under supplemental irrigation. About 19,000 new farms could be developed and the agricultural production of the basin might be increased about 10 percent from present levels. A cooperative study of the local impacts of the Wappapello reservoir development was undertaken at the request of State agencies to indicate ways of lessening adverse effects. It was found that adverse local impacts could be reduced by improving acquisition, compensation, land management and leasing practices, improved appraisals, and keeping local people better informed.

14. A pilot study of supplemental irrigation during the year has been concerned primarily with the exploration of problems associated with water rights and with the problems created by competition between water uses. An analysis of the water rights situation in Michigan indicates that irrigators are operating on questionable grounds when they appropriate surface waters for irrigation. The irrigator now may find his rights blocked by court refusal to regard irrigation as a riparian use, by court injunctions, or by appropriation of his water supply by upstream operators. Legislation is needed to clarify the farmer's right to use waters for irrigation. Findings were used by the Michigan Agricultural Conference in drafting a proposed surface water law.

15. Farm tenure studies showed that private individuals own 85 percent of the farm land in the United States; corporations, 6 percent. Farm ownership ordinarily comes after the owner has passed the peak of physical ability to do heavy farm work. Only one out of four owners was under 45 years of age. Less than one-third of the present owners had climbed the so-called agricultural ladder from laborer, to tenant, to owner. Due to the large size of grazing land tracts in the West and plantation-type holdings in the South, a large proportion of the acreage of land in farms is held by relatively few owners. Three percent of the owners held 41 percent of the farm land held by individuals, while 38 percent held only 5 percent of the farm land owned by individuals. Purchase has been the chief means of reaching ownership. A study of ownership problems in the Midwest indicates that attaining ownership without family help is a difficult process. Only one owner out of six had made a will providing for the transfer of his land.

16. Farm-mortgage-credit studies show farm debts secured by real estate of 5.4 billion dollars on January 1, 1950. This was 6 percent greater than on the same date a year earlier and 16 percent above January 1, 1946, when it was at a 34-year low point. Data for the first half of 1950 indicates a further rise in mortgage debt and at about the same rate as in 1949. Although the rate of advance is still moderate, it was three times higher in 1949 than in either 1946 or 1947 and nearly a third higher than in 1948. There is no evidence of any material change, during 1950, in the amount of new farm-mortgage loans made; but principal payments, particularly advanced payments, have diminished. In contrast to 1948, the expansion in debt in 1949 was relatively uniform throughout the country. The States having the largest expansion are located primarily in the far West, the Mountain areas, and in the South Central and South Atlantic regions. Further research in cooperation with the Bureau of the Census is in progress to provide bench-mark estimates of the farm-mortgage debt on January 1, 1950 and 1951, by States, and by lenders as well as to provide data on the number, value, and other characteristics of mortgaged farms, the amount of debt and interest rates by States and by tenure of farm operators. In addition, this study will provide data to show the number of farmers who have relatively heavy debts and how many have paid their debts down to safe levels (Figures 10 and 11).

17. The work on farm financial management stressed the needs and competitive position of farmers in obtaining capital for developmental purposes. Definite trends in demand for certain agricultural commodities point to an eventual readjustment of agricultural enterprises in many areas, which will require new capital investments. The greatest need from the standpoint of the amount of funds involved is for enlargement of undeveloped and inefficient farm units. More developmental capital might be made available through credit extension if lenders would place more emphasis on future incomes as the primary security instead of the value of the real property, and if certain other modifications were made in the usual terms and conditions of credit. A financial survey of farm operators in Virginia indicates that many farmers lack the means to make any very substantial changes in their farm organization even for defense purposes. These, in the main, are operators of small farms. Their financial reserves are very small and their incomes, after providing for living expenses, are too small to support much borrowing. Thus farm adjustments which involve substantial expenditures for machinery, livestock, or construction are largerly beyond their means.

18. Farm assets in current dollars will be higher on January 1, 1951 than ever before, largely because of rising farm real estate values, but also because of more livestock and machinery on farms and some increase in crop and livestock prices. In terms of 1940

dollars, the major increase since 1940 has been in financial assets, although significant increases have occurred in farm machinery and motor vehicles and in household furnishings and equipment. Financial assets are estimated at 21.6 billion dollars as of January 1, 1951. Although deposits and currency holdings on that date were $3\frac{1}{2}$ times larger than in 1940, because of the higher prices farmers now pay such holdings had only 1-3/4 times as much purchasing power as in 1940 (Figure 12).

19. Deposits of individuals, partnerships, and corporations in insured commercial banks located in primarily agricultural counties were slightly lower at mid-1950 than at mid-1949. These deposits are roughly indicative of the trend of farmer-owned deposits, and they have had a downward trend since 1947. Banks in the agricultural areas have met the decline in deposits by reducing their holdings of cash reserves and U. S. securities (Figure 13). In most areas country banks are in good position to maintain the volume of their loans to farmers. However, a recent study in Vermont indicates that a number of country banks in that State are approaching their loan limits. The Korean outbreak was followed by sharp increases of borrowing by farmers from production credit associations, and by substantially decreased purchases and increased redemptions by farmers of U. S. Savings Bonds.

20. Farm fire losses were estimated to be 4 percent lower in 1949 than in 1948, $95 million compared with $99 million. The farm mutuals are building up safety reserves at a steady rate to enable them to carry farmers in higher-loss years without extra assessments. There is a wide differential between the rates of farmers' mutuals and the commercial companies in the Southeast, where fire-loss rates are high and where there are fewer farm mutuals operating than in most other areas. Statistical series (insurance in force, losses paid, expenses and reserves) are maintained on the operations of approximately 1,850 farm mutuals, by States and by years. About a fifth of them also now insure against windstorm hazard. Information on causes of loss are being assembled from the farm fire mutuals.

21. Property taxes levied on farm real estate continued to rise despite a substantial decline in farm income. This is the sixth consecutive year in which average farm real estate taxes per acre for the country as a whole have risen. There is no immediate appearance of a reversal of trend although the rate of increase is becoming smaller. A further increase in these particular levies is significant because they are now above the point reached during the previous peak year 1929 and because these taxes are a fixed item of farm expense. Income tax payments of farmers to the Federal Government were somewhat less than a year ago. This was expected in view of the drop in farm income. Some progress was made in estimating State income tax payments of farmers. There are 31 States that levy such taxes, and an effort is being made to develop a State income tax payment series comparable with the present Federal series (Figure 14).

Prices, Income and Marketing:

1. The postwar decline in farm income which began in 1948 continued in the first half of 1950. Cash receipts from farm marketings during the first half of the year were approximately 9 percent less than in the first half of 1949. However, prices received by farmers strengthened in the last half of the year largely as a result of developments arising from the Korean situation. Cash receipts in 1950 are expected to total 27.6 billion dollars, or 2 percent under the 1949 total. Gross farm income--including Government payments, the value of home consumption and the rental value of dwellings in addition to cash receipts from marketings--is estimated at 31.8 billion dollars in 1950, only slightly below 1949. But farmers' expenses of production have risen in 1950 and farmers' realized net income may total about 13.3 billion dollars, or 6 percent below 1949 and one-fourth lower than the postwar high in 1947. (Figure 15).

   A very strong demand for most farm products is in prospect for 1951. Prices and incomes received by farmers are likely to be substantially higher than in the first half of 1950, as are prices and incomes in the Nation generally. But higher costs of production and of living, higher taxes and increasing difficulties in obtaining supplies and hired farm labor are also in prospect. In view of the price increases for agricultural commodities that have already occurred and the likelihood of larger agricultural production in 1951, cash receipts from farm marketings will probably be up at least 10 percent next year. Farm operators' realized net income may rise 15 percent or more from 1950, but is not likely to regain the levels of either 1947 or 1948. Nonagricultural income, however, is expected to rise above the record high established this year.

2. A continuous analysis of food supplies is maintained and estimates of per capita food consumption by civilians are appraised and revalued regularly in the "Food Situation" and other releases of the Bureau. The continued high level of food production in the United States in 1949-50 made possible (1) civilian per capita food consumption in the fiscal year 1949-50, 11 percent above the 1935-39 average; and (2) continued large exports of about 35 billion pounds, although 30 percent smaller than the record of 49 billion pounds established in the preceding year. A new record of food exports was made in each successive postwar year from 1945-46, through 1948-49. Food exports in 1949-50 were down substantially from 1948-49, due mainly to a 40 percent drop in exports of wheat and flour.

   Supplies of most agricultural products are likely to be ample for both civilian and military requirements. Another year of large farm production has been realized. Althrough crop output is smaller than in 1949, principally because of reduced acreages for several major crops under the allotment program, production of livestock and livestock products is larger. Larger carry-overs of wheat, corn and cotton than a year ago offset smaller production of these crops this year.

The estimates of per capita food consumption by civilians and the data on the supply and distribution of food in the United States have been used extensively in public reports and administrative studies including the Economic Report of the President.

Increasing use is being made of the data on supplies and distribution of major foods in measuring the impact of the defense program on requirements of food for civilians and for the military.

3. In the commodity situation reports which cover all of the major groups of farm commodities, continuing analyses of the underlying causes of price, supply, and consumption changes are provided. During 1949-50, the commodity situation was characterized by declining prices and large supplies. Since the outbreak of the conflict in Korea, the major emphasis has been the appraisal of the impact of growing demand on farm products and the prospective requirements for food and fiber. However, the long term position of agricultural commodities continues to receive attention. For example, the world cotton economy is undergoing substantial changes. Areas of production of raw cotton are changing in importance, centers of textile production are changing, as are the centers of textile exports. Competition between cotton and synthetics, particularly rayon, for a greater share of the world markets for textiles has been increased. Currently, however, the demand for fibers is so large that maximum output of all types can be readily absorbed. Other items of interest are:

(a) The United States is now more dependent upon foreign sources for apparel wool than in prewar years due to a higher level of mill consumption and a sharp decline in domestic production. The decline in domestic production since 1942 occurred largely because returns from sheep and wool in relation to capital investment and costs have been less than for other agricultural enterprises. Some expansion in domestic wool production may take place during the next few years. Demand will continue high partly as a result of increased military requirements.

(b) As a result of below-average relationships of dairy prices to feeds and other farm products, the rise in milk production leveled off in mid-1950. With relatively stable production and increasing consumer demand, fluid milk prices have been advancing and storage stocks of dairy products held by the Government have been reduced.

(c) A more favorable outlook is developing for the poultry industry despite the termination of dried egg purchases by the Government. Demand for eggs has increased sharply in recent months. Higher consumer incomes are also strengthening the demand for poultry.

(d) Before Korea, prices of hogs had trended downward for 2 years while prices of cattle were more nearly stable. With a strong demand for meat in prospect, and ample supplies of feed available, it now appears probable that meat animal production will increase in 1951 and will provide for military needs and a slightly larger civilian consumption as well. Total supplies of feed grains and other feed concentrates for 1950-51 are about as large as the record supply last year and are a third larger than in 1937-41. Demand for feed is much stronger than last year, prices are higher and heavier utilization is in prospect. Carry-over of feed grains into 1951-52 will be smaller than this year's record carry-over, with the reduction principally in corn.

(e) Supplies of wheat for 1950-51 are adequate to take care of all prospective domestic and export requirements, and leave a substantial carry-over on July 1, 1951. Wheat prices this season have been near the support level of $1.99 per bushel average farm price. The estimated acreage seeded to winter wheat for harvest in 1951 is 6 percent above the acreage seeded for the 1950 crop, and the 1951 price support will again be set at 90 percent of parity, but not less than $1.99 per bushel.

(f) Heavy demand for fats and oils since the outbreak of hostilities in Korea has been reflected in an increase of about 40 percent in prices of these commodities from June to December, despite a large output of fats and oils. Productions of fats and oils, including the oil equivalent of domestic oilseeds exported in the year which began October 1, 1950 probably will be slightly larger than the record output of 12 billion pounds produced a year earlier. Demand for fats and oils in this period is expected to be strong.

(g) Prices received by farmers for fruit in 1950 generally were higher than in 1949. There was another sharp rise in output of frozen concentrated citrus juices, which more than doubled from the previous year. Demand for fruit in 1951 is expected to be stronger than in 1950, though prices probably will not rise proportionately, as total production of fruit in 1951 may be moderately larger under average weather conditions. Recent events have greatly strengthened the demand and price prospects for canned and frozen vegetables and for dry edible beans, primarily because of increased military requirements, but are expected to have less effect on demand for fresh vegetables, sweetpotatoes and dry peas. Potatoes continue in surplus supply, with no support scheduled after the 1950 crop.

4. The farmer's share of the consumer's dollar spent for farm food products rose to 48 cents in October 1950 from a low of 46 cents in June. (Figures 16 and 17). The farmer's share averaged 40 cents during 1935-39 and rose to a war-time high of 54 cents in 1945. The share for food products is expected to average higher in 1951 than in 1950, but may not advance appreciably above the October level. The farmer's share of the consumer's dollar spent for 4 principal tobacco products dropped slightly from 17.5 cents in 1948 to 17.4 cents in 1949, compared with a prewar average share of 10.9 cents for 1935-39. The farmer's share of the consumer's dollar spent for cotton articles rose from 11.7 cents in 1948 to 12.0 cents in 1949 and continued to advance to 12.8 cents in June 1950. The farmer's share for cotton products averaged 9.3 cents during 1935-39.

5. Charges for marketing a family "market basket" of farm food products declined to $338 (on an annual basis) in October 1950 following a rise from $324 in April to $355 in July, associated with the United States participation in the United Nations military action in Korea. The "market basket" represents valuation at current prices of average annual purchases by a family of 3 average consumers during 1935-39. Retail food prices showed little change following the high point reached in July 1950, and prices received by farmers for equivalent food products declined slightly in October after advancing during the first 9 months of 1950. From the retail price peak of July 1948 to October 1950 retail cost of the "market basket" declined 56 dollars of which 50 dollars represented the fall in prices paid to farmers and the remaining 6 dollars represented a decline in the margins of marketing agencies. Charges for marketing tobacco products, excluding excise taxes, advanced slightly from 1948 to 1949 while charges for marketing a group of cotton articles declined more than 10 percent from 1948 to 1949 and showed little further change to March and June of 1950.

6. Consumer expenditures for foods accounted for 26 percent of their disposable income (excluding direct personal taxes) in the third quarter of 1950, compared to 27 percent in 1949 and a prewar average of 23 percent. A large proportion of 1950 expenditures for foods represents a substantial increase over prewar in the quantities of foods consumed per capita, and a larger proportion of expenditures for prepared meals purchased in eating places. The same quantities and descriptions of foods which accounted for 23 percent of disposable income in 1935-39 could have been purchased for 19 percent of disposable income in the third quarter of 1950. (Figure 18).

The national bill for marketing farm food products from producers to the retail store level rose slightly from 18.0 billion dollars in 1948 to an all-time record of 18.2 billion dollars in 1949, while retail value of these foods dropped from 38.0 billion to 36.2 billion dollars and farm value of equivalent products dropped from 20.0 billion

to 18.0 billion dollars. The ratio to investment of operating profit less provision for federal taxes declined slightly from 1948 to 1949 for a group of 43 food processing companies and for a group of 4 tobacco manufacturing companies, but showed a slight rise for 8 retail food chains. Labor costs appear to have constituted an increasing proportion of total food marketing costs during the past decade, and unit labor costs of marketing foods continued to rise, but less rapidly than hourly earnings of food marketing employees. (Figure 19).

7. Consumer preference work has been carried on in the field of children's clothing and in household fabrics. These complement previous studies on consumer attitudes toward cotton and competing fibers in both women's and men's clothing. They were both carried out on a national scale with the endorsement of other government agencies concerned with problems in the field of cotton production and marketing, various industrial groups, and the National Cotton Council.

   Continuing attention is being given to problems of methodology. In this field the measurement of intensity of preference is important. One approach to such measurement involves "paired comparisons." This method produces preference ratings for each of a number of related items. The ratings are obtained by having the interviewed person state which item he prefers, when each one is compared to every other one in the group, this comparison being carried out in a series of parings. Another methodological study involves experiments to identify the basic motivating factors which operate in a buying situation. This study utilizes methods of content analysis. It attempts to identify statements which reflect the effective desires or economic needs of the respondent which influenced the purchasing decision and to measure their relative importance by the number of statements made about each.

8. Preliminary analysis of a study of the market potential for protein materials for industrial use made by a commercial agency under contract indicates that vegetable protein materials may become increasingly important in several industrial uses, particularly in the field of regenerated fibers as a replacement for or supplement to wool. Other promising industrial outlets for vegetable oil protein materials include paper coating and adhesive applications. Research plans in some of the regional laboratories have been influenced by these findings.

9. Acceptance studies of sweetpotato products for food use in the form of candy, snacks, and breakfast food have indicated possibilities for future commercial developments. However, further physical developmental research needs to be undertaken before commercial manufacturing would be profitable. Such research is underway at the present time.

10. Findings under a number of regional marketing projects, carried on in cooperation with a number of the State Experiment Stations, have yielded valuable information on marketing methods and marketing problems. For example, a study of inter-market price relationships for milk in the Northeastern region analyzes the expected effects upon prices and milk supply areas of seasonal changes in supply, changes in freight rates and other factors. It is striking that only a narrow price differential is necessary to allocate adequate milk supplies to the different markets. This is in contrast to the wide differences and fluctuations in historical inter-market price relationships. Marketing of Southern eggs is made difficult by the large number of small producers, by lack of incentives for quality maintenance, and by wide seasonal variations in marketing. The outlet for about two-thirds of the eggs produced in the region consists of some type of retail store, and there is a high rate of deterioration of eggs before they reach the market. A study of poultry marketing in the Los Angeles area indicates that per capita consumption of poultry in that area is low and suggests that there may be important possibilities for increasing demand and consumption. A recently published report, "Shifts in the Trade in Western Slaughter Livestock," shows that slaughter of meats in the 12 Western States during the last quarter century rose from 3 billion to 6 billion pounds live-weight per year. In the same period population rose but two-thirds. Associated with the increase in slaughter has been an eastward shift of the "line of east-west movement" which separates the livestock supply areas for the eastern and western concentrated consuming areas.

Farm Population and Manpower:

1. A new and improved definition of the farm population has been introduced into the decennial census and recent sample surveys of the Bureau of Agricultural Economics and the Census Bureau. Families who rent a farm house for cash but are not connected with the operation of the farm will no longer be included in the farm population. As many as one or two million persons may be reclassified for inclusion in the rural-nonfarm population. Special tabulations and analyses will be undertaken to revise the basic series of annual farm population estimates to the basis of the new definition.

2. The population of every major geographic division in the United States is expected to increase between now and 1975, according to projections recently made. No curtailment of farm production for local consumption appears in prospect for any major area. Local demand for farm production in the Pacific States is expected to increase markedly in line with anticipated population increases of as much as one-third to two-thirds in the next twenty-five years.

3. Current estimates have been issued on the age, sex, and employment status of the farm population. In comparison with the situation before World War II, the proportion of farm residents 45 years of age and over increased significantly. About nine-tenths of the decline in the farm population between April 1940 and April 1949 occurred among persons under 25 years of age. There was a decline in the number of farm residents employed in agriculture of 900,000 between 1940 and 1949. In contrast, farm residents in nonagricultural industries rose from 2,180,000 to 3,700,000 in the 9-year period. The long-time trend of decline in farm population is expected to continue (Figure 20). The percent that rural farm population makes up of the total population has been mapped by counties (Figure 21).

4. A special study on migratory farm laborers has just been completed that shows a marked increase in their numbers since 1945. In 1949, the total number of migratory farm workers in the United States totaled one million. Many of the migratory workers were illegal entrants from Mexico and about 300,000 had been apprehended by the Immigration and Naturalization Service and sent back to Mexico before the end of the year. The report of this work shows the annual earnings from both farm and nonfarm work and the duration of employment.

5. The hired farm working force in 1949 included more than 5 million different persons, according to a recent survey. Because of the increase in numbers, hired workers got less employment in 1949 than in the preceding year. Persons reporting hired farm work at some time during the year averaged $532 wage income from 90 days of farm wage work and 28 days of nonfarm work. Persons principally engaged in farm wage work averaged $925 wage income for the year from both farm and nonfarm work, including 211 days of farm work and 14 days of nonfarm work. (Figure 22).

6. Analysis of current data on farm employment, farm labor supply, and farm wage rate levels during the year formed the basis for various reports on the agricultural manpower situation. Recent emphasis has been on appraisal of the farm manpower situation with respect to mobilization, deferments, and universal military training in connection with interagency work groups set up by the National Security Resources Board and the National Selective Service System.

   In 1949, the annual average agricultural employment of about 8 million included 2.4 million men aged 18 to 38 years, 1 million of whom were estimated to be single. A reduction of one-half million in this number would reduce the proportion of men of military age among farm workers to what it was in the last year of World War II. Total farm employment has decreased since 1940. (Figure 23).

7. Analyses of urban and rural levels of living show that the farm population has made relative gains in use of electricity, and in percent of births which take place in hospitals but it had relative losses in telephones and available physicians and dentists. (Figures 24 and 25.)

8. Utilization of Health Services: The use being made of medical services by rural people is being studied in cooperation with Land Grant Colleges in four counties in Mississippi and four counties in New York. The portion of the work already completed shows differences in use of health services as influenced by such factors as income, occupation, distance from trading center, age, sex, education, and participation in organizations. While analyses are not yet complete, preliminary findings show that high income families and village families make more use of the services than low-income families and people living in the open country. Generally, least use of all is made by the lower income people living at the greatest distances from the services. The higher income groups make about the same use of the services irrespective of distance.

9. An annotated bibliography has been issued on Social Security and Related Insurance for Farm People. A special study has just been completed on the coverage of hired farm workers under the Old Age and Survivors Insurance program as provided for in the new amendment to the Social Security Act. The average cash wage of the year-round workers who will be covered is $100 a month. The payroll tax for such a worker will cost a farmer about $18 a year. It was estimated that out of about 5,000,000 persons who worked on farms for wages during some part of the year about 650,000 were covered.

Crop and Livestock Estimates

Under this appropriation the Bureau prepares and issues the official crop and livestock reports. The 41 field offices of the crop reporting service are called upon to prepare more than 10,000 State reports a year which are combined into about 500 national or regional releases. These reports furnish current, national and state information on acreage, yield, production, stocks and prices received by farmers for more than 150 farm products. In addition to the regular program of reports, the Bureau also provides special statistical services or prepares special estimates needed in connection with the official programs or emergency actions. Some of the outstanding services of the past year are cited in the following examples:

1. An extensive wheat variety survey was made in all States early in the fiscal year, covering the wheat crop of 1949. This is a survey that is repeated at five-year intervals in cooperation with the Bureau of Plant Industry, Soils and Agricultural Engineering, to determine the shifts occurring in planting of wheat varieties. Results are much in demand and widely used in encouraging the growing of varieties which have demonstrated their superiority under varying conditions.

2. Similar surveys of barley varieties, to assist in varietal improvement work, were made in four major producing States: Minnesota, North Dakota, South Dakota, and California. Interest centered particularly on how widely some of the newly developed varieties were being planted and the extent to which malting types were grown.

3. The program on production and stocks of seeds was expanded to cover more crops, particularly legumes, winter cover crops, and native grasses. Need for the information was brought about by the growing demand for seeds in Soil Conservation Service work throughout the country and in foreign countries. Information has been published for the first time on certain fescue, vetch, bent grass, rye grass seeds and similar items of growing interest.

4. Information has been assembled on farm storage and off-farm storage capacity, which has been greatly needed in connection with the proper handling and storage of grain crops, particularly in emergency situations. In particular, studies have been made to devise a method of estimating farm-grain storage capacity.

5. The utilization of the pecan crop was shown for the first time in a report issued the past year covering the 1948 crop in the 10 principal producing States. The estimates of the quantity shelled, the quantity marketed in shell, and the quantity consumed in the growers' households were prepared for each State. These estimates were extremely useful to pecan growers in the Southeastern States in connection with the 1949 pecan marketing agreement.

6. Work was completed and material published on the usual time of bloom and harvest of apples. The need for this information has been frequently urged as a desirable guide in the marketing of apples, similar to earlier reports issued on cherries and peaches. The report indicates the principal areas of apple production in each State and data are presented for 19 different apple varieties.

7. Further progress was made in the coordination and timing of monthly estimates of livestock slaughter and meat production. The time required for processing data on Federally-inspected slaughter was reduced and non-inspected slaughter data were also expedited. These moves resulted in speeding up the report about a week.

8. Enumeration of prices of beef cattle has been further developed in 12 major States and the enumerative results used to improve the method of estimating monthly average prices received by farmers for beef cattle. Selected samples of commission firms, auction rings, packers, and other buyers have been canvassed each month to draw off data on the market prices of beef cattle by classes. These data are then combined into weighted average prices to represent all cattle in the respective states.

9. Separate estimates of the prices received for milk for fresh market and for milk used primarily for manufacture are currently prepared in 29 States. Price data are obtained on milk used for cheese, for butter and creamery byproducts, and for canning and other uses. These are combined into an average price of all milk for manufacture, which is used in calculating a parity equivalent for manufacturing milk.

10. During this past fiscal year a thorough-going review of the parity index was completed to incorporate an allowance for cash wages paid for hired farm labor and to shift the base period for the index of prices received in accordance with the parity legislation included in the Agricultural Act of 1948 and 1949. Parity prices for some 165 agricultural commodities were recomputed, in accordance with this legislation and published in January and July.

The program for the current fiscal year provides for the acceleration of the quarterly reports on prices paid and improvement in the price collecting program in 12 state offices covering 17 States. This expanded program, for which additional funds were provided in the 1950 Appropriation Act, will supply more complete and accurate information than has heretofore been available concerning prices farmers receive for commodities they sell and prices they pay for the goods and services they buy.

11. Illustrative of the contribution made in providing information to the public on important developments affecting farm products, there is attached a Calendar of Release Dates for reports issued in 1950 covering crops, livestock and livestock products and prices. This compilation indicates the continuous and systematic schedule which must be met in performance of this service.

Comparison of Certain Work-Load Data
Agricultural Estimates (Including Cooperative Work)
Fiscal Years 1949 and 1950 with Estimates for 1951 and 1952

	Fiscal Year 1949	Fiscal Year 1950	Fiscal Year 1951	Fiscal Year 1952
Separate inquiries mailed to farmers and others	11,077	11,500	11,000	11,000
Copies of schedules distributed	8,258,000	9,000,000	8,600,000	8,600,000
Schedules tabulated	1,988,000	2,200,000	2,075,000	2,075,000
Questions per schedule (average)	21	20	20	20
Reports prepared	5,930	5,900	5,800	5,800
Copies of reports distributed	8,523,000	9,000,000	8,500,000	8,500,000
Printed releases distributed	2,498,000	2,600,000	2,500,000	2,500,000
Special inquiries answered by mail	26,800	29,000	28,200	28,200
Special inquiries answered by telephone	36,800	37,000	37,000	37,000
Personal interviews (exclusive of enumerations)	16,000	17,000	16,000	16,000
Special county estimates prepared	134,300	160,000	160,000	160,000
Miles of travel within State	943,000	1,100,000	950,000	950,000

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
CROP REPORTING BOARD

1950 C A L E N D A R 1950

CROP, LIVESTOCK, and LIVESTOCK PRODUCTS REPORTS

RELEASE DATES

RELEASE DATES 1950

RELEASE DATES 1950

Day	January	February	March	April	May	June	July	August	September	October	November	December	Day
1	- - -Sun.- - -		Wool Production and Income 1949: Evaporated, Cond. & dried Milk; Dried casein; Milk sugar.	- - -Sat.- - -	Evap., Condensed & Dried Milk; Dried casein; Milk Sugar.		- - -Sat.- - -	Lamb Crop		- - -Sun.- - -			1
2	- - -Hol.- - -		Shipment of Package Bees; Mohair Produc. and Income. 1949	- - -Sun.- - -			- - -Sun.- - -		- - -Sat.- - -	Evap., Condensed & Dried Milk; Dried casein; Milk Sugar.	Sunflower	- - -Sat.- - -	2
3		Meat Scraps and Tankage		Chickens & Eggs, Produc. & Income; Interstate Movement of Dairy Cattle.	Crop Disp. & Sales of Prin. Field & Seed Crops; Meat Scraps & Tankage.	- - -Sat.- - -		Meat Scraps and Tankage	- - -Sun.- - -		Meat Scraps and Tankage	- - -Sun.- - -	3
4	Livestock Slaughter	- - -Sat.- - -	- - -Sat.- - -			- - -Sun.- - -	- - -Hol.- - -		- - -Hol.- - -		- - -Sat.- - -		4
5		- - -Sun.- - -	- - -Sun.- - -		Cotton Revisions; Truck Crop News			- - -Sat.- - -	Mustard	Red Clover	- - -Sun.- - -		5
6	Truck Crop News			Truck Crop News	- - -Sat.- - -	Truck Crop News	Kentucky Bluegrass; Truck Crop News	- - -Sun.- - -	Truck Crop News	Truck Crop News			6
7	- - -Sat.- - -	Truck Crop News	Truck Crop News		- - -Sun.- - -			No. of Milk Cows on farms, June; Truck Crop News		- - -Sat.- - -	Truck Crop News	Truck Crop News	7
8	- - -Sun.- - -			- - -Sat.- - -			- - -Sat.- - -	Cotton; Production of Shorn Wool, 1950	Cotton	- - -Sun.- - -	Cotton	Cotton	8
9			Early Lamb Crop	- - -Sun.- - -		General; Truck Crops for fresh market & proc.; Farm Labor	- - -Sun.- - -	Stocks of Field Seeds	- - -Sat.- - -	Cotton		- - -Sat.- - -	9
10	General; Truck crops for fresh market & proc.; Farm Labor	General; Farm Labor; Truck Crops for fresh market	General; Truck Crops for fresh market & proc.; Farm Labor	General; Farm Labor; Truck Crops for fresh market & proc.;	General; Farm Labor; Truck Crops for fresh market & proc.	- - -Sat.- - -	Cotton	General; Farm Labor; Truck Crops for fresh market & proc.	- - -Sun.- - -	General; Farm Labor; Truck Crops for fresh market & proc.	General; Farm Labor; Truck Crops for fresh market & proc.	- - -Sun.- - -	10
11		- - -Sat.- - -	- - -Sat.- - -	Development of Early Lamb Crop	Development of Early Lamb Crop	- - -Sun.- - -	General; Truck Crops for fresh market & proc.; Farm Labor		General; Farm Labor; Truck Crops for fresh market & proc.	Honey Produc. and Stocks; Cattle Feeding Situation	- - -Sat.- - -	General; Farm Labor; Truck Crops for fresh market	11
12	Sheep and Lambs on Feed	- - -Sun.- - -	- - -Sun.- - -		Intended acreage & Prusp. Production of vegetable seeds		Hybrid Corn	- - -Sat.- - -		Lamb Feeding Situation	- - -Sun.- - -	Cattle Feeding Situation	12
13	Acres & Prod. of Vegetable seeds; Farm Disp. & Sales of Fruit & Nut Crops		Young chickens & Potential layers on farms		- - -Sat.- - -		Orchard Grass	- - -Sun.- - -		Alfalfa; Fruits; Citrus, Production and Utilization	Seasonal Average Condition of Dairy Pasture	Lamb Feeding Situation	13
14	- - -Sat.- - -	Potato Stocks; Quarterly Naval Stores			- - -Sun.- - -				Sweetclover	- - -Sat.- - -			14
15	- - -Sun.- - -	Livestock&Poul. on farms Jan.1 Milk Produ.on farms & Dairy Plant Prod. 1949; Hatchery	Hatchery; Potato Stocks	- - -Sat.- - -	Hatchery; Quarterly Naval Stores	Hatchery	- - -Sat.- - -	Hatchery; Quarterly Naval Stores; Apple Production by Varieties	Hatchery; Bermuda Grass; Bromegrass & Wheatgrasses	- - -Sun.- - -	Hatchery, Quarterly Naval Stores; Cattle Feeding Situation	Hatchery	15
16	Hatchery; Fluid Milk & Cream	Fluid Milk & Cream	Fluid Milk & Cream	- - -Sun.- - -	Fluid Milk & Cream	Fluid Milk & Cream	- - -Sun.- - -	Stocks of Vegetable Seeds; Fluid Milk & Cream	- - -Sat.- - -	Hatchery Fluid Milk & Cream	Fluid Milk & Cream; Lamb Feeding Situation	- - -Sat.- - -	16
17				Hatchery; Farm Prod., Disp. & Income from Milk 1949; Fluid Milk & Cream		- - -Sat.- - -	Hatchery; Fluid Milk & Cream; Mustard Seed		- - -Sun.- - -			- - -Sun.- - -	17
18	Turkey Produc.; Cabbage Stocks; Onion Stocks; Cattle on Feed; Peanut Stocks & Processing	- - -Sat.- - -	- - -Sat.- - -	Peanut Stocks & Processing	Peanut Stocks & Processing	- - -Sun.- - -	Peanut Stocks & Processing	Bentgrass & Fescue; Peanut Stocks & Processing	Fluid Milk & Cream; Peanut Stocks and Processing	Sudan Grass; Peanut Stocks and Processing	- - -Sat.- - -	Annual Summary; Fluid Milk & Cream; Truck Crops for fresh market & proc.; Apple Prod. by Varieties	18
19	Potato Stocks	- - -Sun.- - -	- - -Sun.- - -	Cattle on Feed	Truck Crops for Processing; Truck Crop News	Peanut Stocks and Processing	Cattle on Feed	- - -Sat.- - -			- - -Sun.- - -	Peanut Stocks and Processing	19
20	Naval Stores; Honey & Beeswax Prod. & Value; Truck Crop News	Naval Stores; Peanut Stocks and Processing	Prospective Plantings; Naval Stores	Naval Stores	- - -Sat.- - -	Naval Stores	Naval Stores	- - -Sun.- - -	Naval Stores	Naval Stores; Truck Crop News	Naval Stores; Peanut Stocks and Processing	Seedings of 1951 W. Wheat & Rye; Naval Stores	20
21	- - -Sat.- - -	Truck Crop News	Truck Crop News Peanut Stocks and Processing	Truck Crops Proc. Truck Crop News Ev.& Cond. Milk Who. Grocer's St.	- - -Sun.- - -	Spring Pig Crop; Sour Cherries	Truck Crop Proc. Truck Crop News Honey& Beeswax Wh. Grocer St. Milk	Naval Stores	Truck Crop News	- - -Sat.- - -	Truck Crop News	Fall Pig Crop; Truck Crop News	21
22	- - -Sun.- - -	- - -Hol.- - -		- - -Sat.- - -	Naval Stores	Crimson Clover; White Clover; Truck Crops for Proc.; Truck Crop News	- - -Sat.- - -	Turkey Produc.; Truck Crop News Cranberries		- - -Sun.- - -			22
23	Evap. & Cond. Milk, Wholesale Grocer's Stocks			- - -Sun.- - -			- - -Sun.- - -	Nut Crops - Production & Utilization	- - -Sat.- - -	Evap. & Cond. Milk, Wholesale Grocer's Stocks	- - -Hol.- - -	- - -Sat.- - -	23
24			Turkey Production & income; Hop Stocks			- - -Sat.- - -		Alsike Clover; Timothy	- - -Sun.- - -	Wheat Stocks; Grain Stocks	Lespedeza	- - -Sun.- - -	24
25	Liquid & Dried Egg Prod.; Canned Poultry; Wheat Stocks; Grain Stocks	- - -Sat.- - -	- - -Sat.- - -	Liquid & Dried Egg Prod.; Canned Poultry; Wheat Stocks; Grain Stocks	Liquid & Dried Egg Prod.; Canned Poultry	- - -Sun.- - -	Liquid & Dried Egg Prod., Canned Poultry; Wheat Stocks; Grain Stocks	Liquid & Dried Egg Prod.; Canned Poultry	Liquid & Dried Egg Prod.; Canned Poultry; Hop Stocks	Liquid & Dried Egg Prod.; Canned Poultry	- - -Sat.- - -	- - -Hol.- - -	25
26	Rations Fed to Milk Cows, 1949	- - -Sun.- - -	- - -Sun.- - -			Liquid & Dried Egg Prod.; Canned Poultry		- - -Sat.- - -			- - -Sun.- - -	Liquid & Dried Egg Prod.; Canned Poultry	26
27		Monthly Egg Prod.; Liquid& Dried Egg Prod; Canned Poultry	Liquid & Dried Egg Prod.; Canned Poultry	Farm Production and Income from Meat Animals, 1949	- - -Sat.- - -		Redtop	- - -Sun.- - -		Prices	Liquid & Dried Egg Prod.; Canned Poultry		27
28	- - -Sat.- - -	Prices; Livestock Slaughter		Prices; Soybean Stocks; Livestock Slaughter	- - -Sun.- - -		Prices; Chickens Raised	Ladino Clover; White Clover		- - -Sat.- - -			28
29	- - -Sun.- - -		Prices	- - -Sat.- - -		Lupine; Fruit; Non-Citrus Prod. & Utilization	- - -Sat.- - -		Prices; Livestock Slaughter	- - -Sun.- - -	Livestock Slaughter	Prices; Certified Potatoes	29
30	Evap., Cond. & Dried Milk; Dried Casein; Milk Sugar		Evap. Cond. & Dried Milk; Dried Casein; Milk Sugar	- - -Sun.- - -	- - -Hol.- - -	Prices; Liv. Sl. Ev. & Cond. Milk Dried Casein Milk Sugar	- - -Sun.- - -	Prices; Evap. Cond. & Dried Milk; Dried Casein; Milk Sugar	- - -Sat.- - -	Evap. Cond. & Dried Milk; Dried Casein; Milk Sugar	Prices; Evap. Cond. & Dried Milk; Dried Casein; Milk Sugar	- - -Sat.- - -	30
31	Prices; Soybean Stocks; Livestock Slaughter		Livestock Slaughter		Prices; Liv. Sl. Ev. & Cond. Milk Dried Casein Milk Sugar		Soybean St. Ev.&Cond. Milk Dried Casein; Milk Sugar; Livest. Sl.	Winter Cover Crops; Livestock Slaughter		Soybean Stocks; Livestock Slaughter		- - -Sun.- - -	31

= Lock-up reports - - -Sat.- - - = Saturday - - -Sun.- - - = Sunday - - -Hol.- - - = Holiday

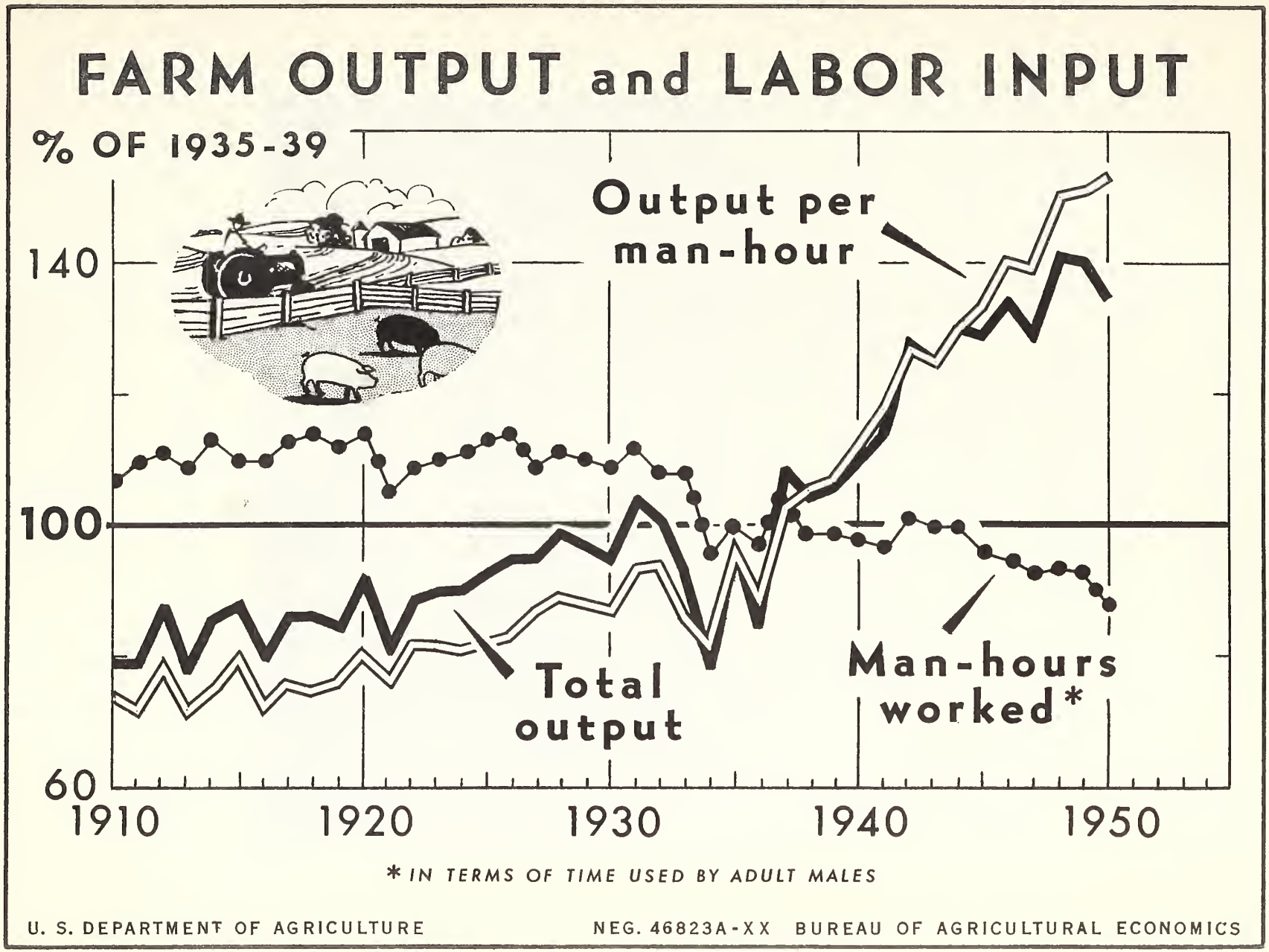
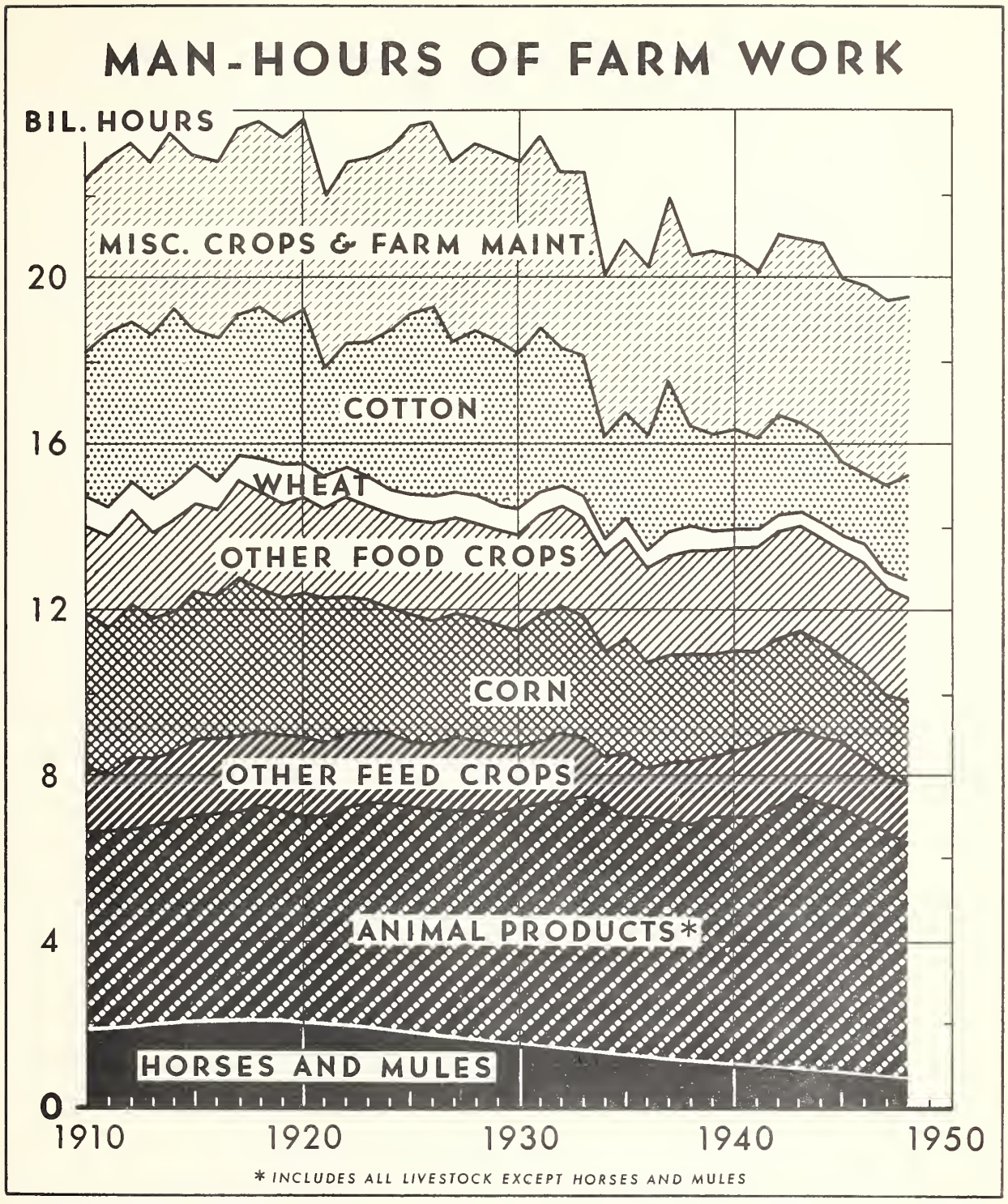
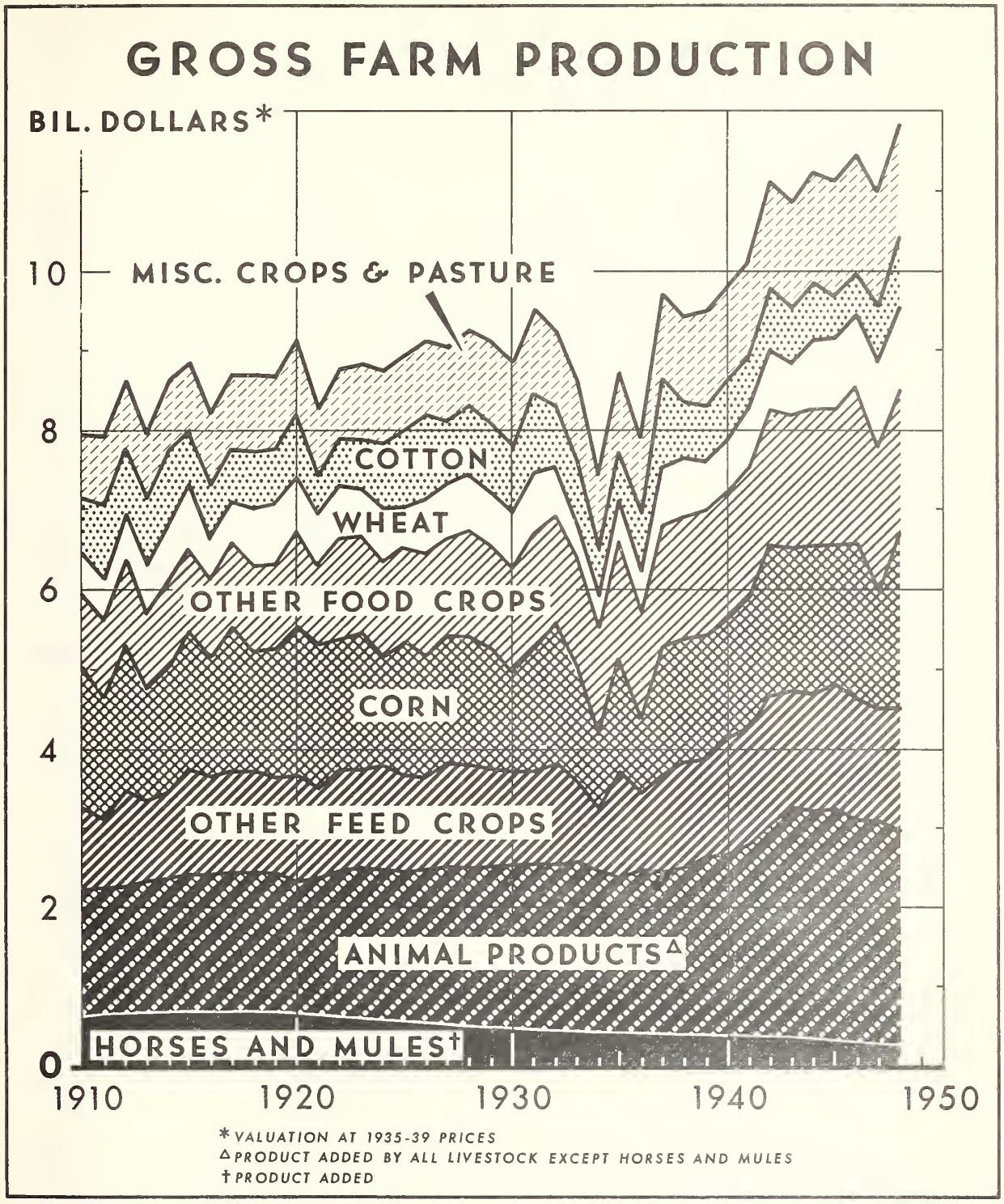

FARM OUTPUT and LABOR INPUT
% OF 1935-39
140
100
60
1910
1920
1930
1940
1950
Output per man-hour
Total output
Man-hours worked*
* IN TERMS OF TIME USED BY ADULT MALES
U. S. DEPARTMENT OF AGRICULTURE
NEG. 46823A-XX BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 1



U. S. DEPARTMENT OF AGRICULTURE NEG. 47650-X BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 2



U. S. DEPARTMENT OF AGRICULTURE NEG. 47651-X BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 3

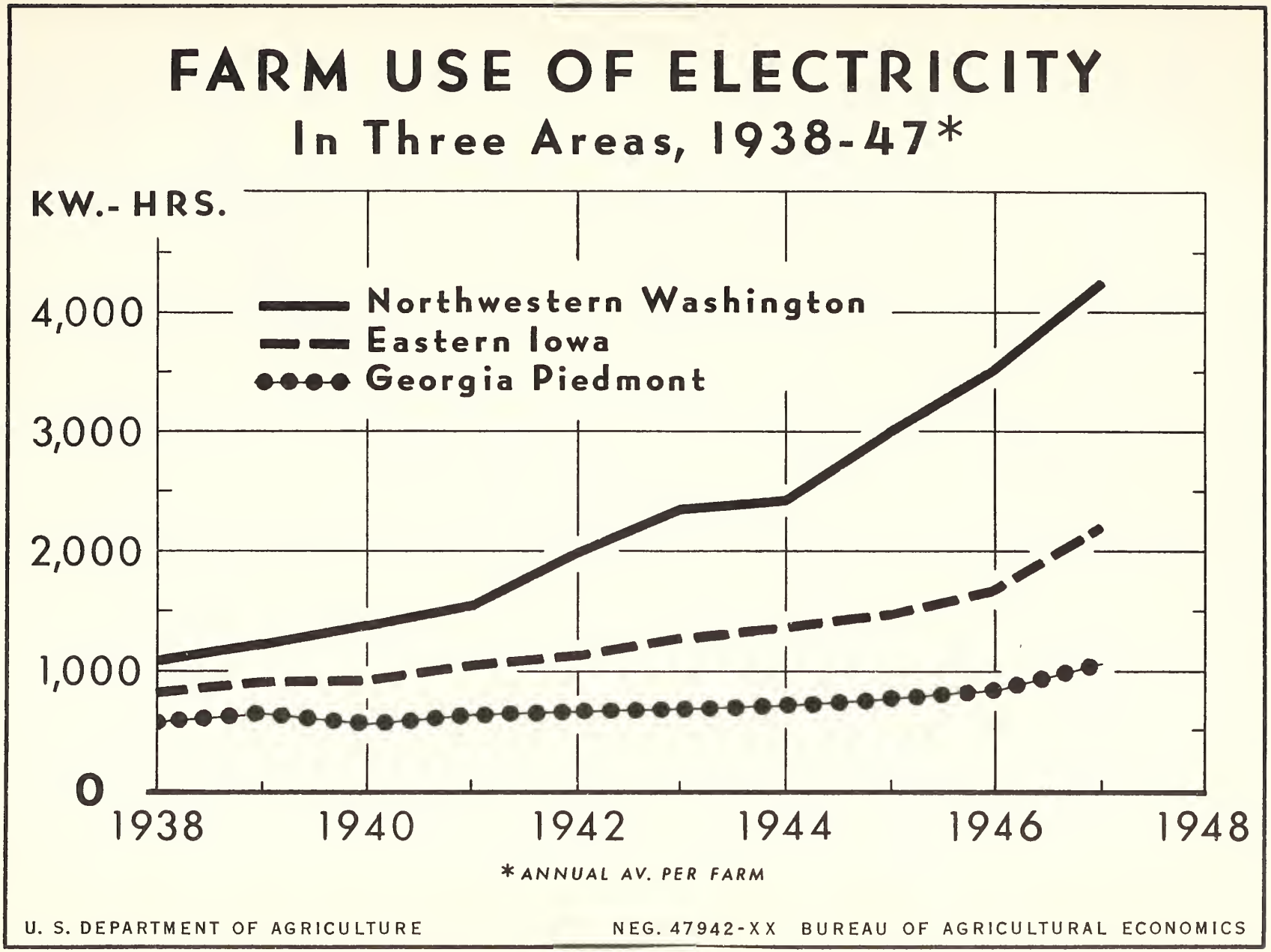
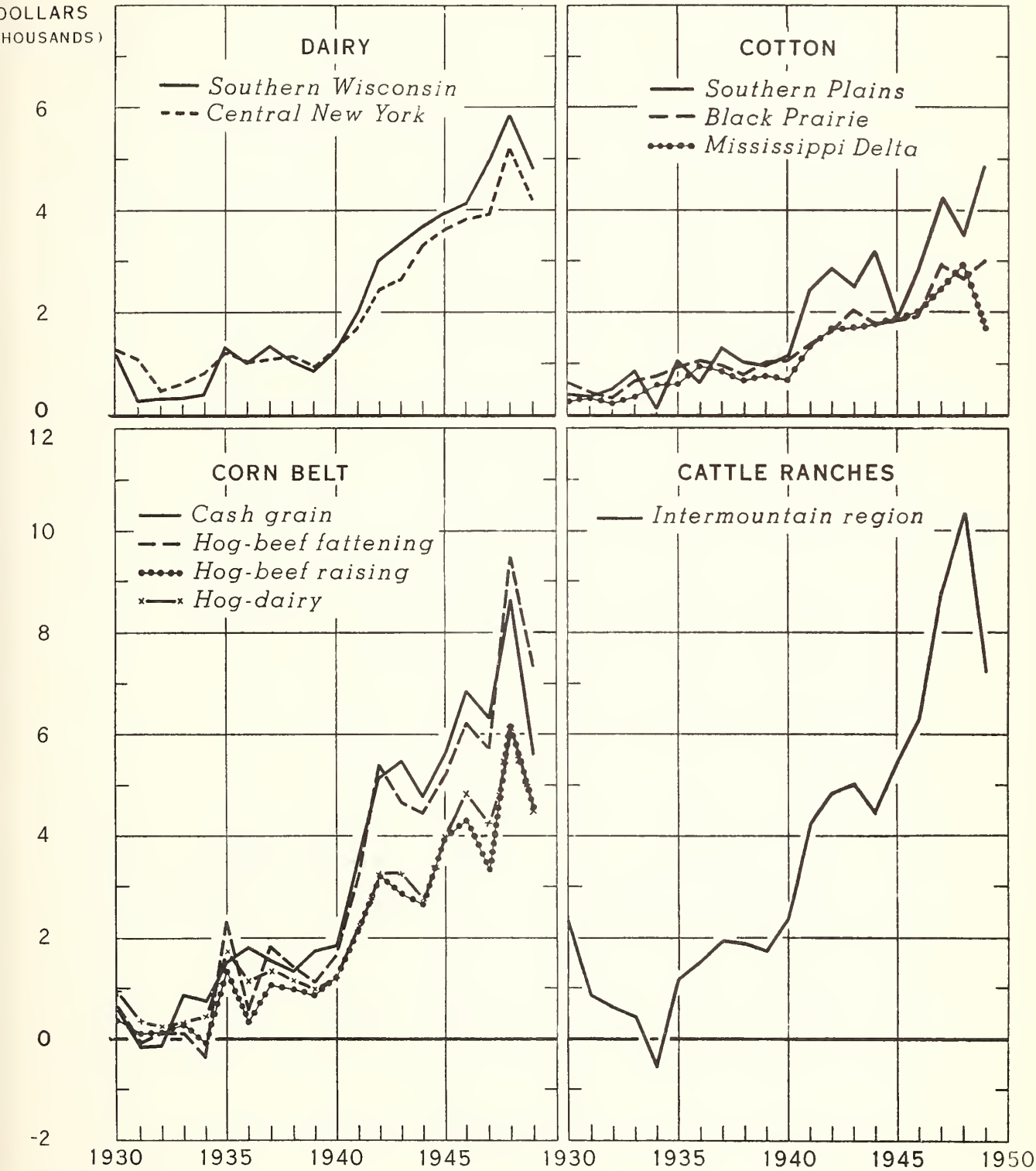

FARM USE OF ELECTRICITY
In Three Areas, 1938-47*
KW.- HRS.
4,000
3,000
2,000
1,000
0
Northwestern Washington
Eastern Iowa
Georgia Piedmont
1938
1940
1942
1944
1946
1948
*ANNUAL AV. PER FARM
U. S. DEPARTMENT OF AGRICULTURE
NEG. 47942-XX BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 4

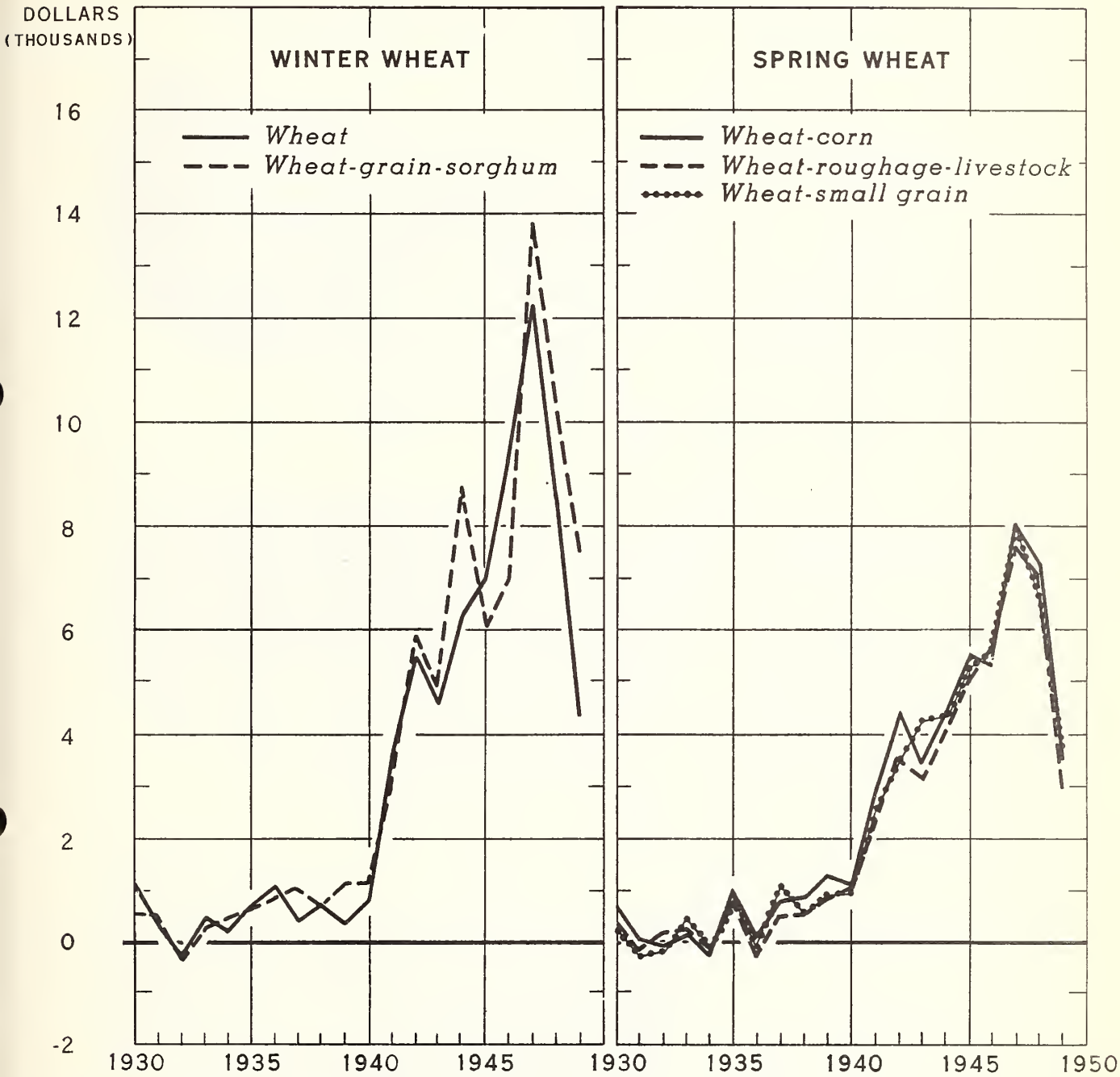
OPERATOR'S NET FARM INCOME, COMMERCIAL FAMILY-OPERATED FARMS, BY TYPE, 1930-49



S. DEPARTMENT OF AGRICULTURE NEG. 47457 BUREAU OF AGRICULTURAL ECONOMICS

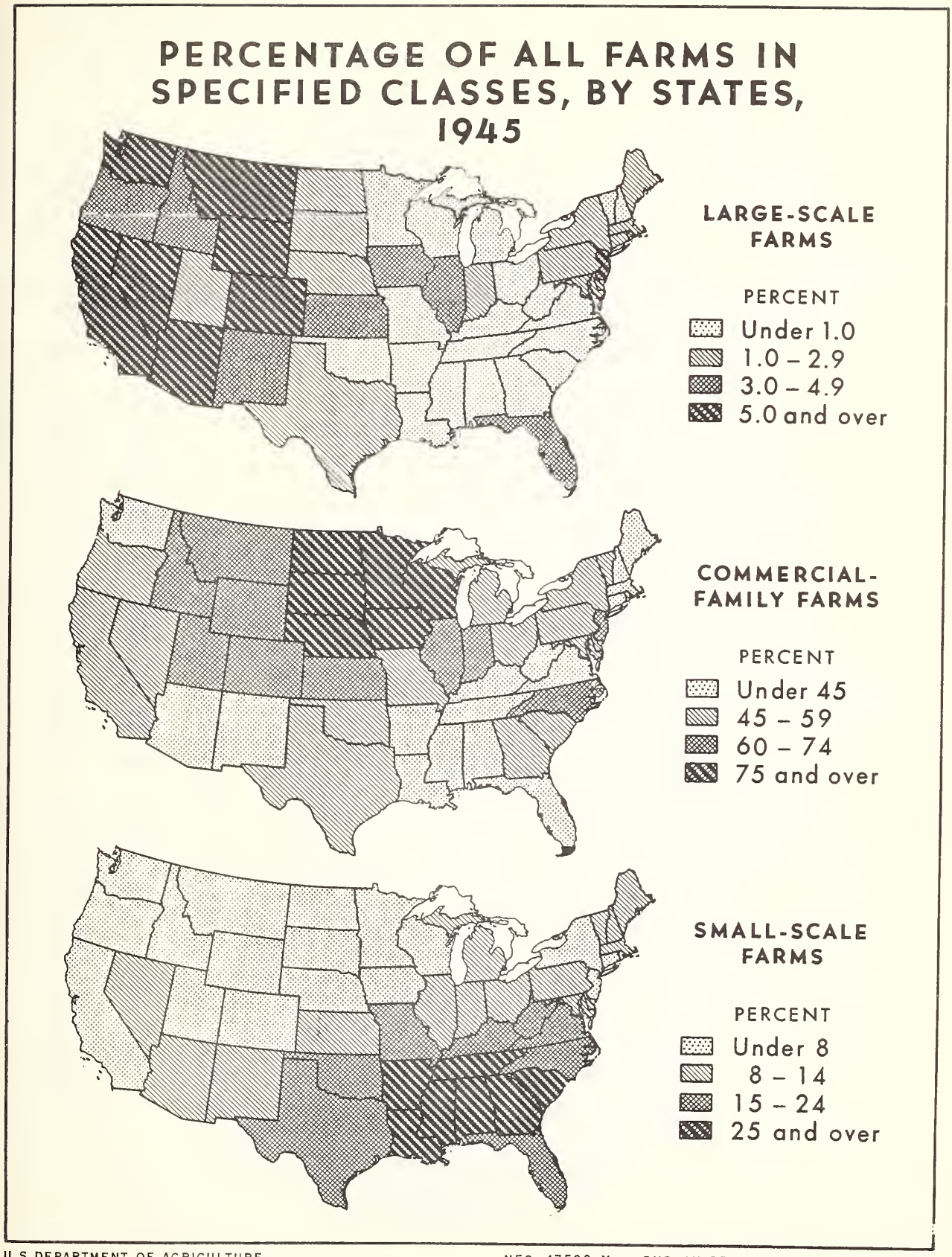
FIGURE 5

OPERATOR'S NET FARM INCOME, COMMERCIAL FAMILY-OPERATED WHEAT FARMS, 1930-49



U.S. DEPARTMENT OF AGRICULTURE NEG. 47458 BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 6



U. S. DEPARTMENT OF AGRICULTURE NEG. 47598-X BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 7

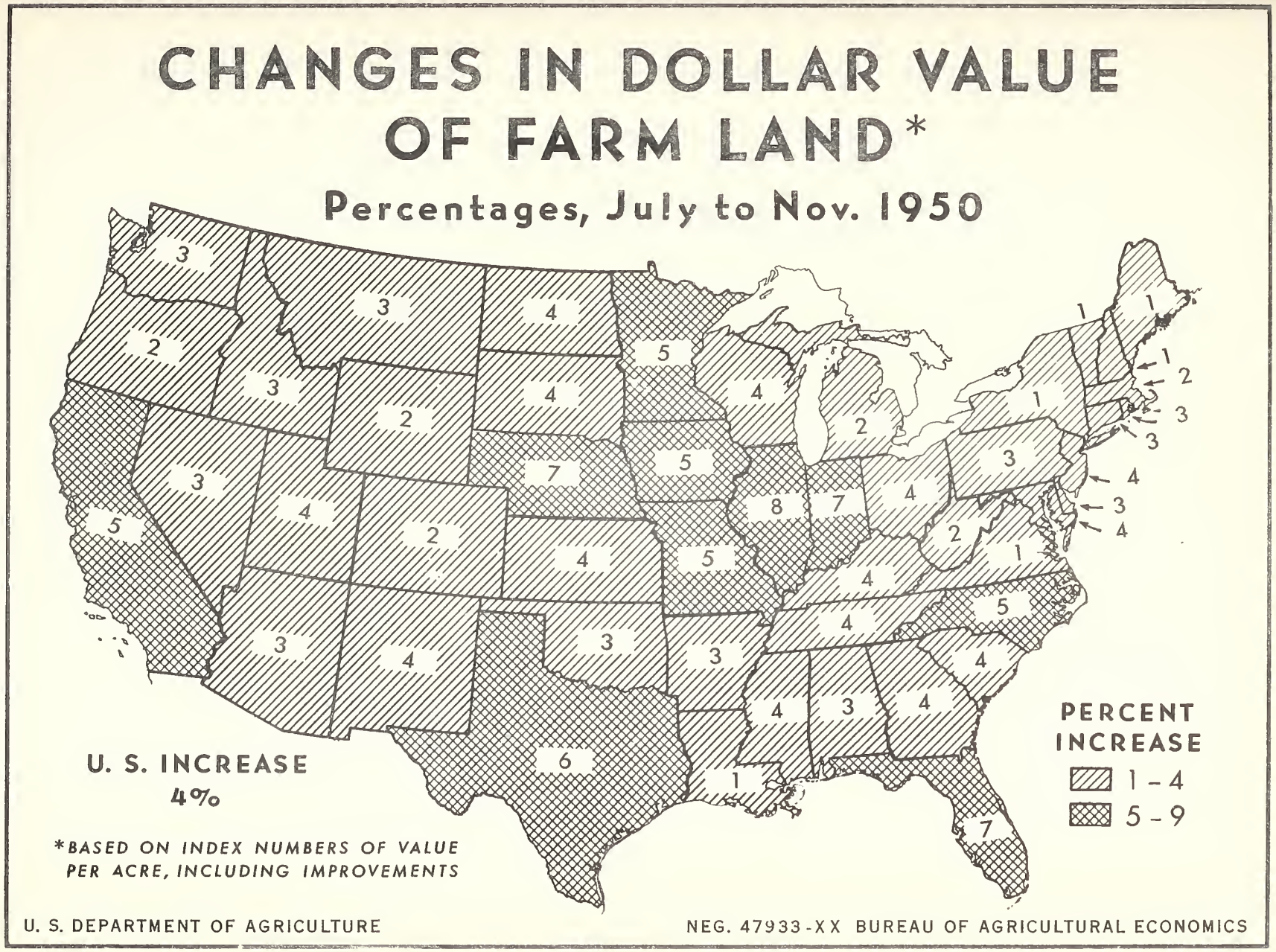

CHANGES IN DOLLAR VALUE OF FARM LAND*
Percentages, July to Nov. 1950
U. S. INCREASE
4%
*BASED ON INDEX NUMBERS OF VALUE PER ACRE, INCLUDING IMPROVEMENTS
PERCENT INCREASE
1 - 4
5 - 9
U. S. DEPARTMENT OF AGRICULTURE
NEG. 47933-XX BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 8

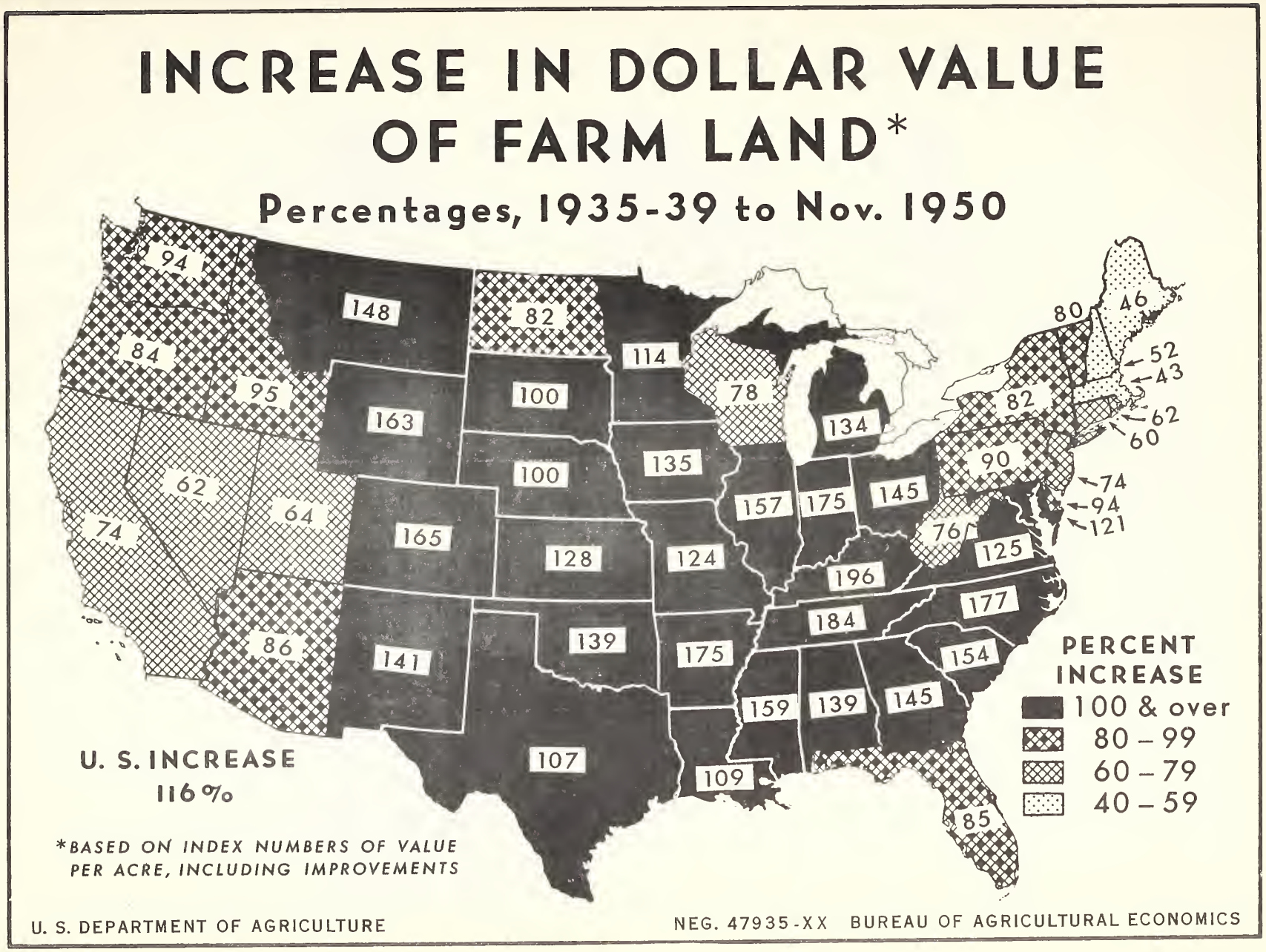
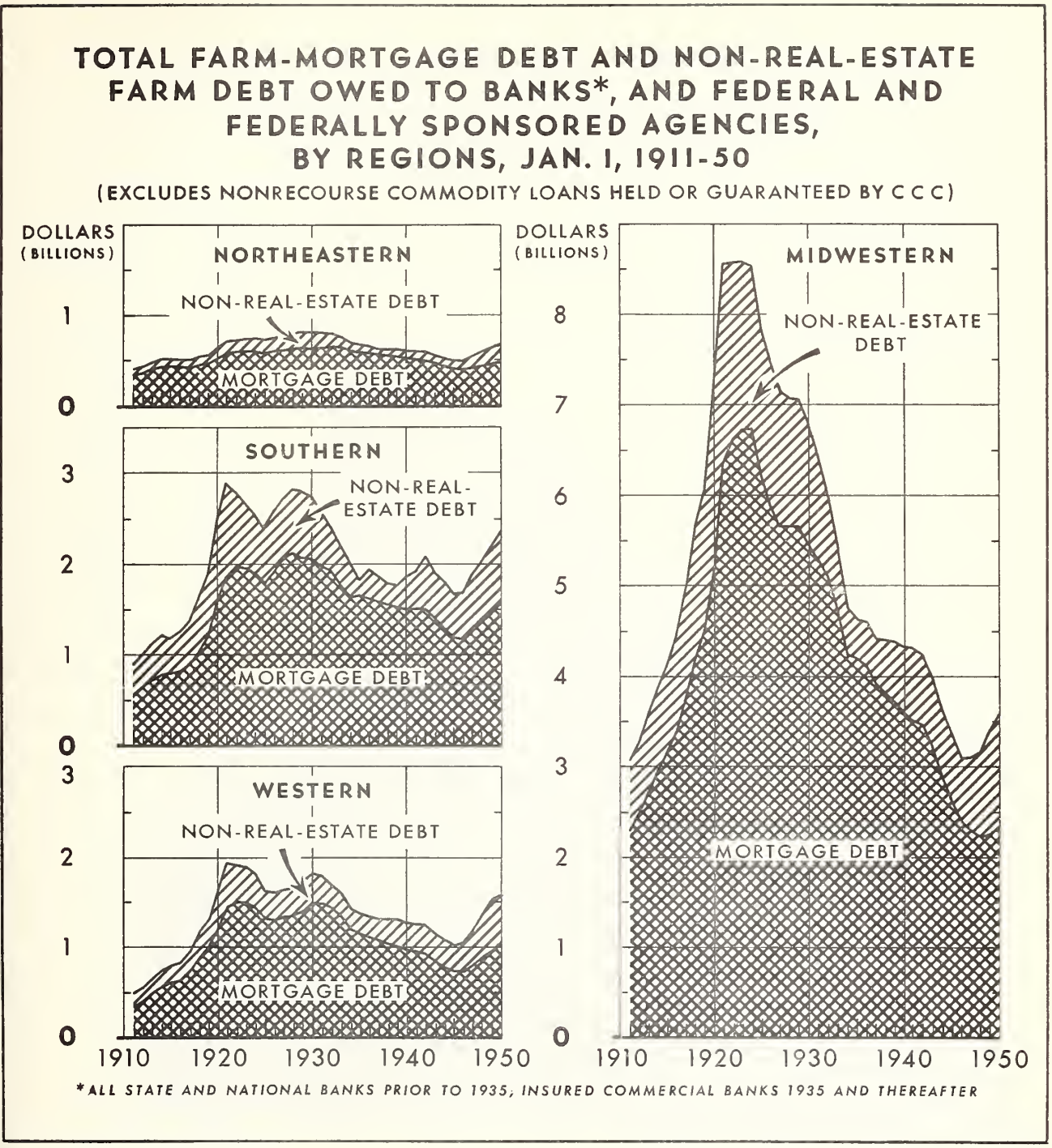
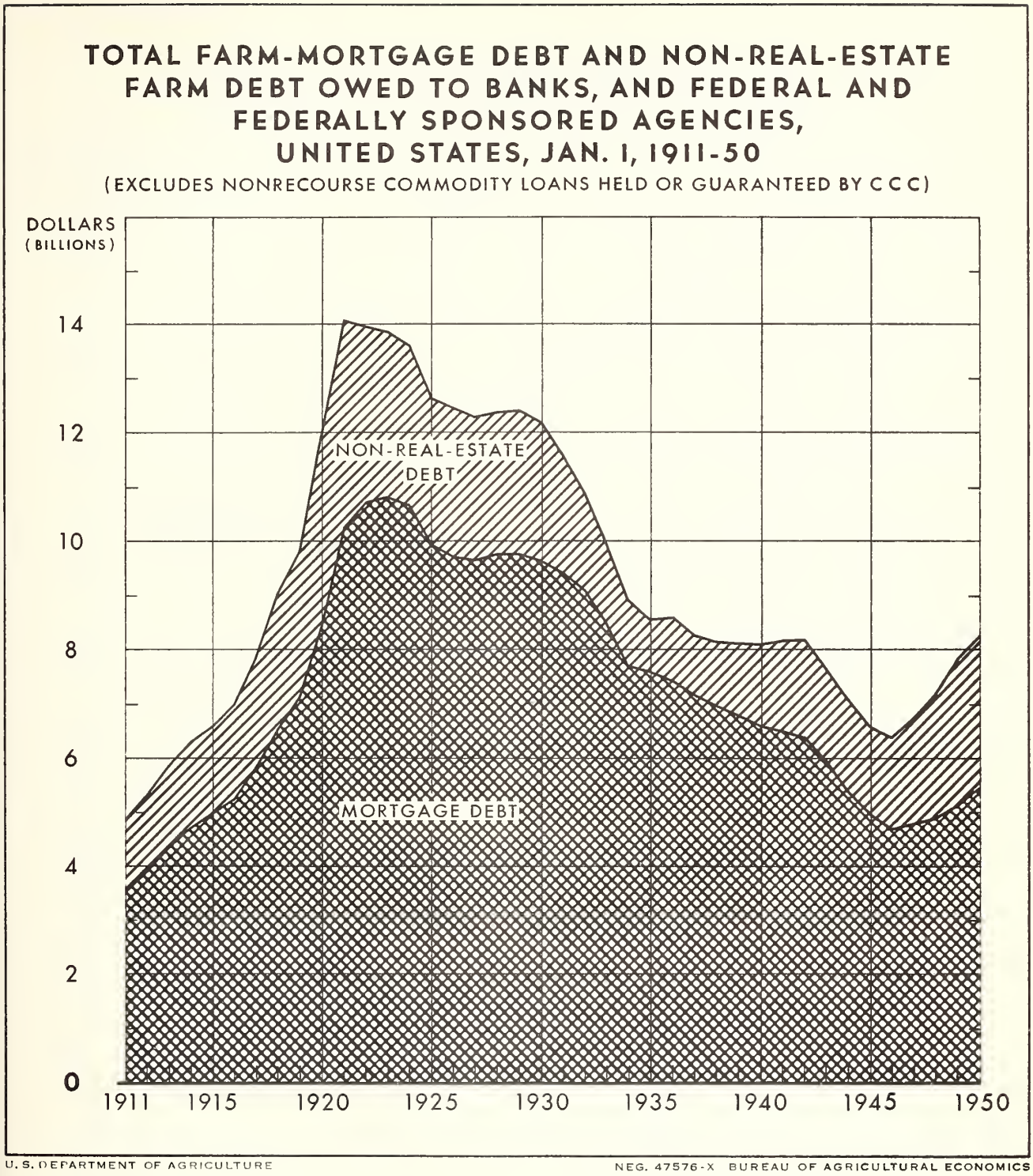

INCREASE IN DOLLAR VALUE OF FARM LAND*
Percentages, 1935-39 to Nov. 1950
94
84
95
62
74
64
86
148
163
165
141
107
82
100
100
128
139
114
135
124
175
109
78
134
157
175
145
159
139
145
196
184
154
177
125
76
90
82
80
46
52
43
62
60
74
94
121
85
U. S. INCREASE
116%
*BASED ON INDEX NUMBERS OF VALUE PER ACRE, INCLUDING IMPROVEMENTS
PERCENT INCREASE
100 & over
80 – 99
60 – 79
40 – 59
U. S. DEPARTMENT OF AGRICULTURE
NEG. 47935-XX BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 9



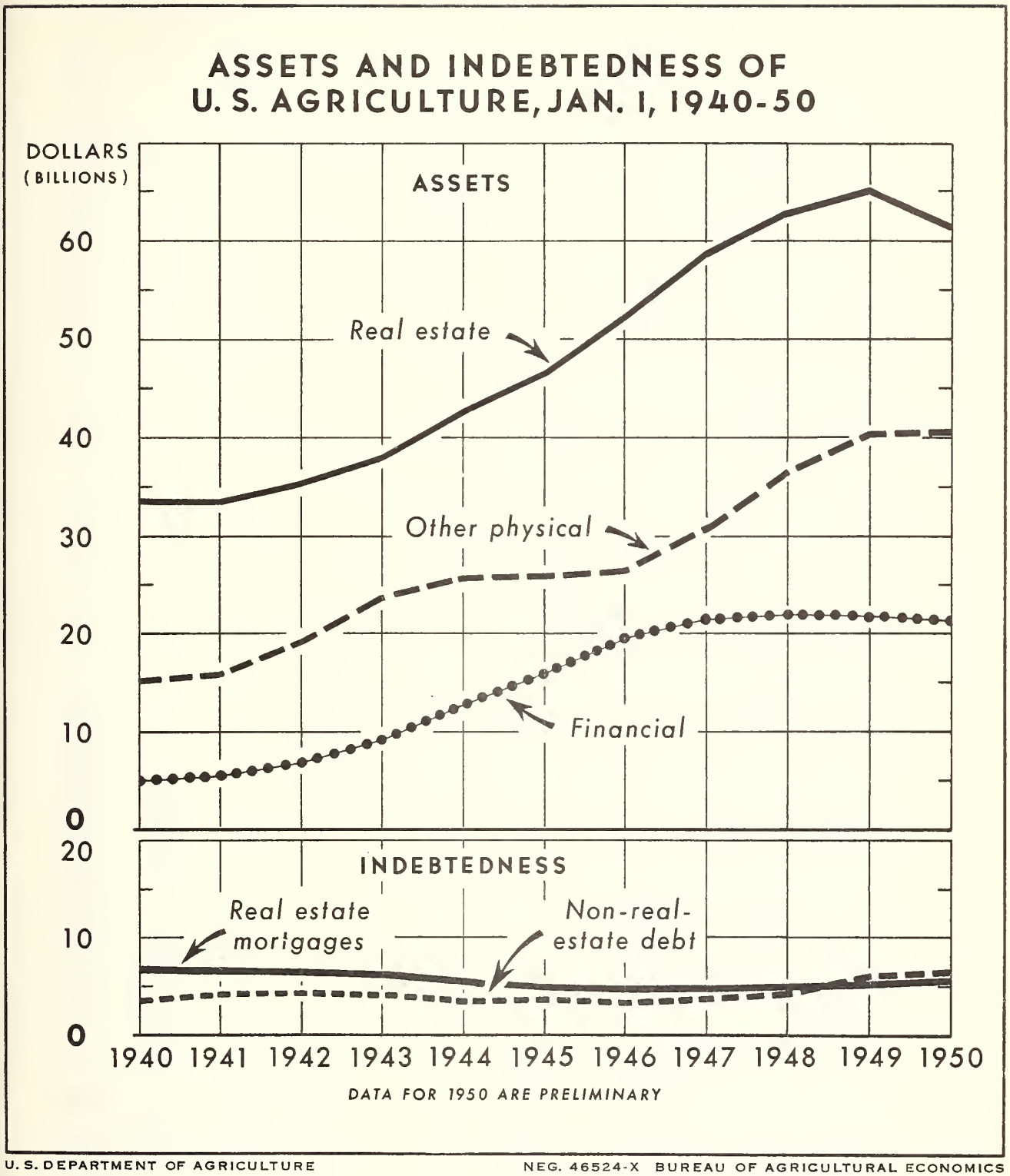
U. S. DEPARTMENT OF AGRICULTURE NEG. 47575-X BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 10



U. S. DEPARTMENT OF AGRICULTURE NEG. 47576-X BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 11



U. S. DEPARTMENT OF AGRICULTURE NEG. 46524-X BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 12

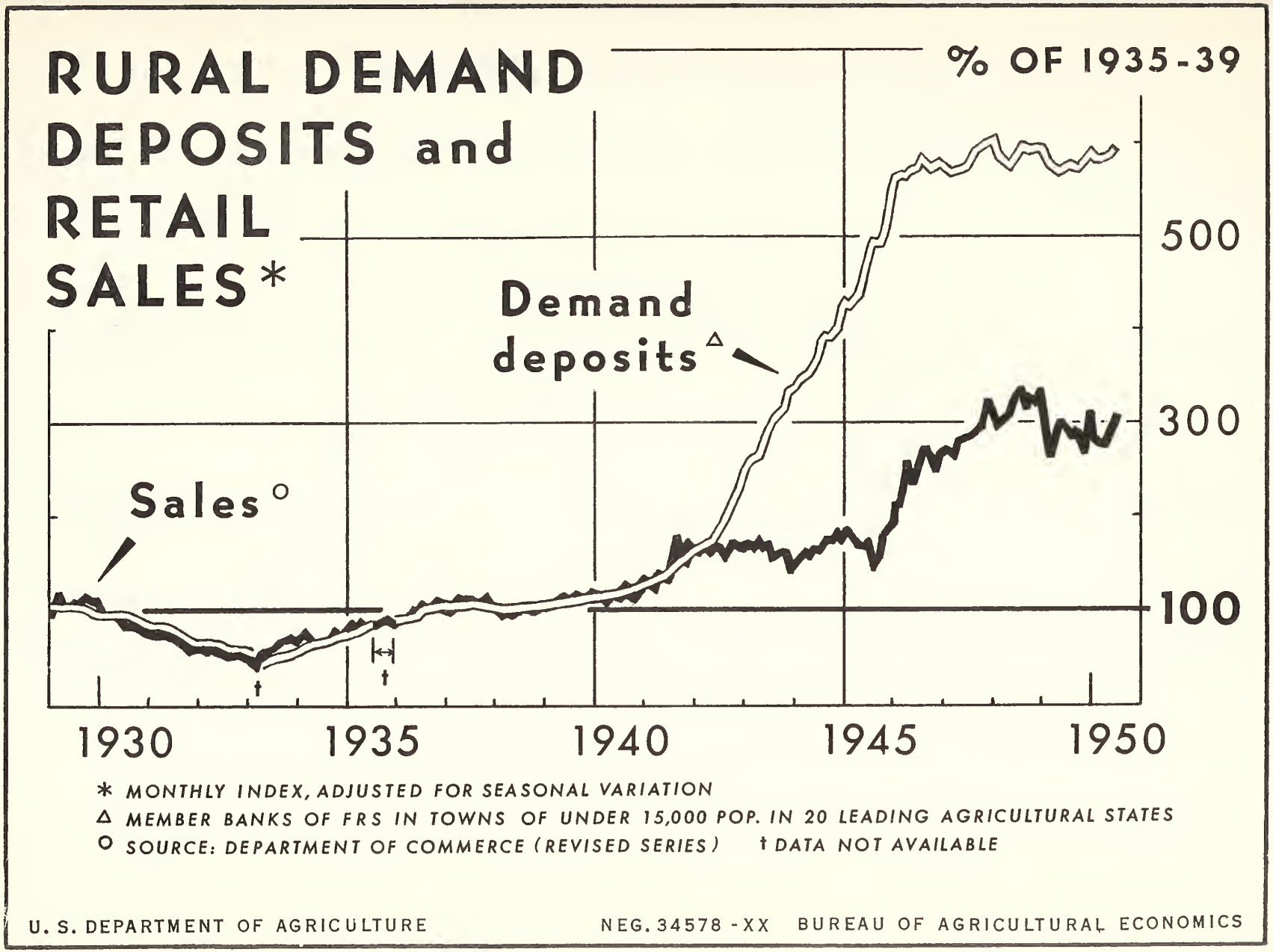

RURAL DEMAND DEPOSITS and RETAIL SALES*
% OF 1935-39
500
300
100
Demand deposits△
Sales○
t
t
1930
1935
1940
1945
1950
* MONTHLY INDEX, ADJUSTED FOR SEASONAL VARIATION
△ MEMBER BANKS OF FRS IN TOWNS OF UNDER 15,000 POP. IN 20 LEADING AGRICULTURAL STATES
○ SOURCE: DEPARTMENT OF COMMERCE (REVISED SERIES) t DATA NOT AVAILABLE
U. S. DEPARTMENT OF AGRICULTURE
NEG. 34578 -XX BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 13

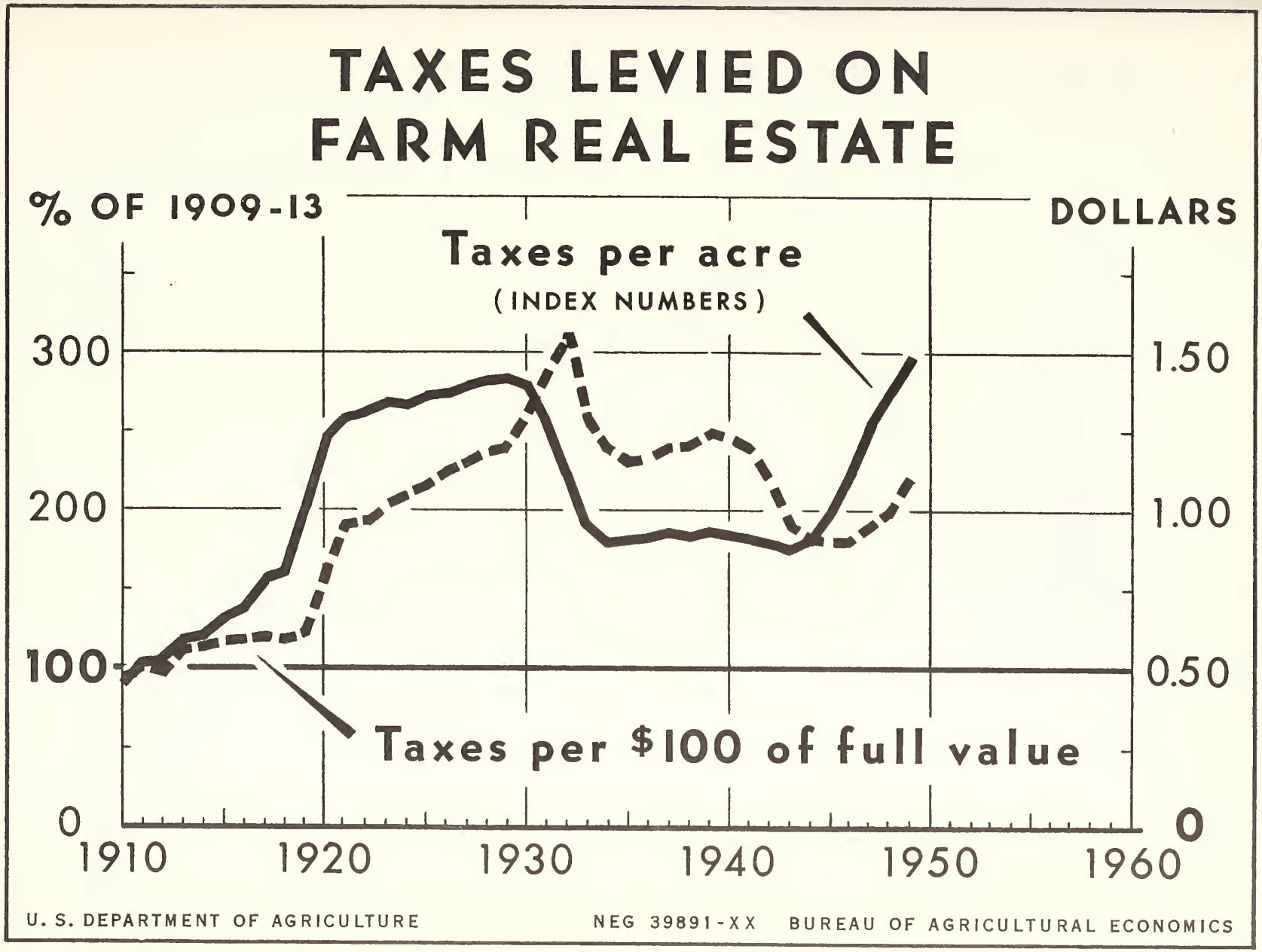

TAXES LEVIED ON
FARM REAL ESTATE
% OF 1909-13
DOLLARS
Taxes per acre
(INDEX NUMBERS)
300
200
100
0
1.50
1.00
0.50
0
Taxes per $100 of full value
1910
1920
1930
1940
1950
1960
U. S. DEPARTMENT OF AGRICULTURE
NEG 39891-XX
BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 14

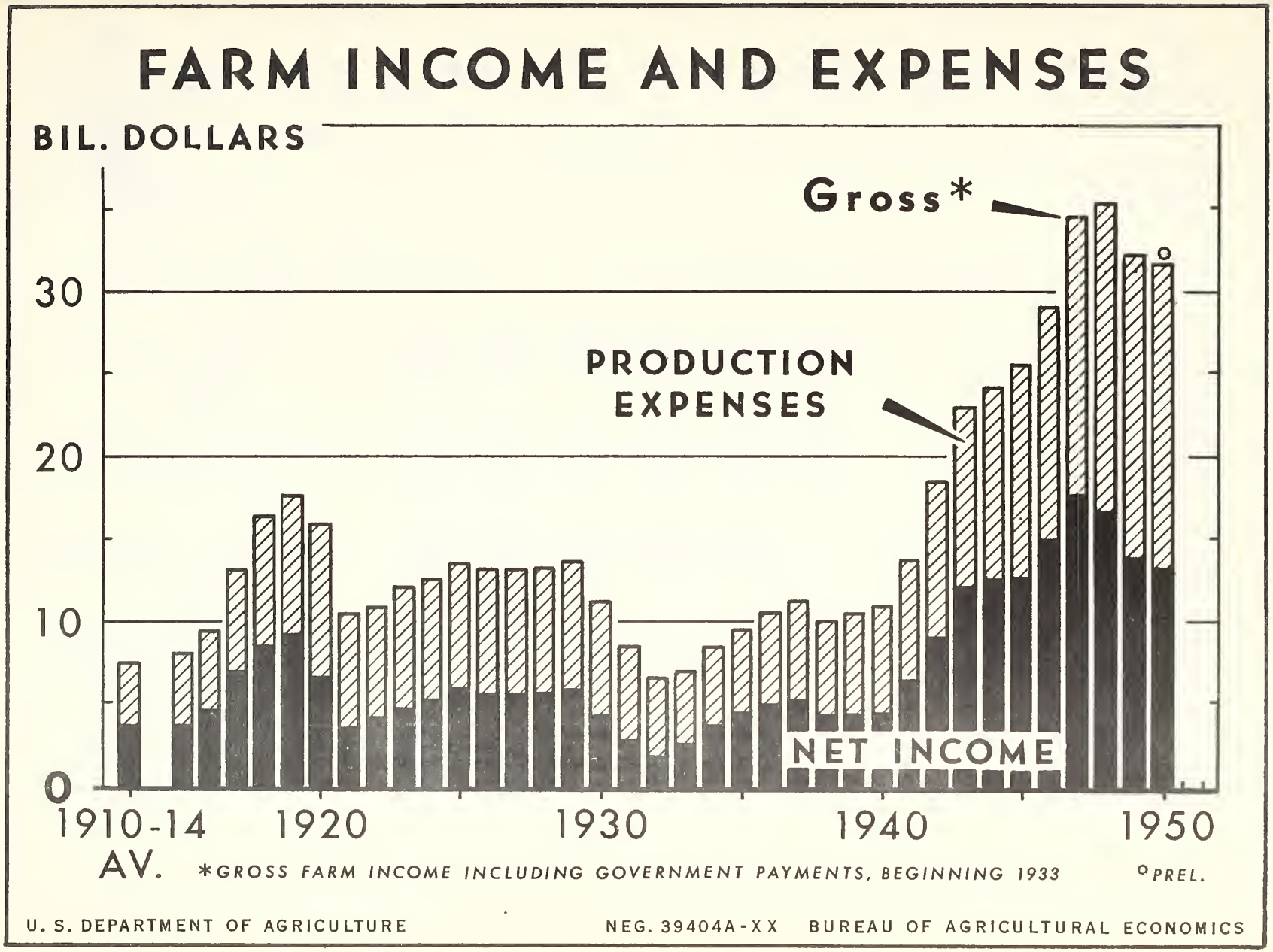

FARM INCOME AND EXPENSES
BIL. DOLLARS
Gross*
PRODUCTION EXPENSES
NET INCOME
30
20
10
0
1910-14 AV.
1920
1930
1940
1950
*GROSS FARM INCOME INCLUDING GOVERNMENT PAYMENTS, BEGINNING 1933
°PREL.
U. S. DEPARTMENT OF AGRICULTURE
NEG. 39404A-XX
BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 15

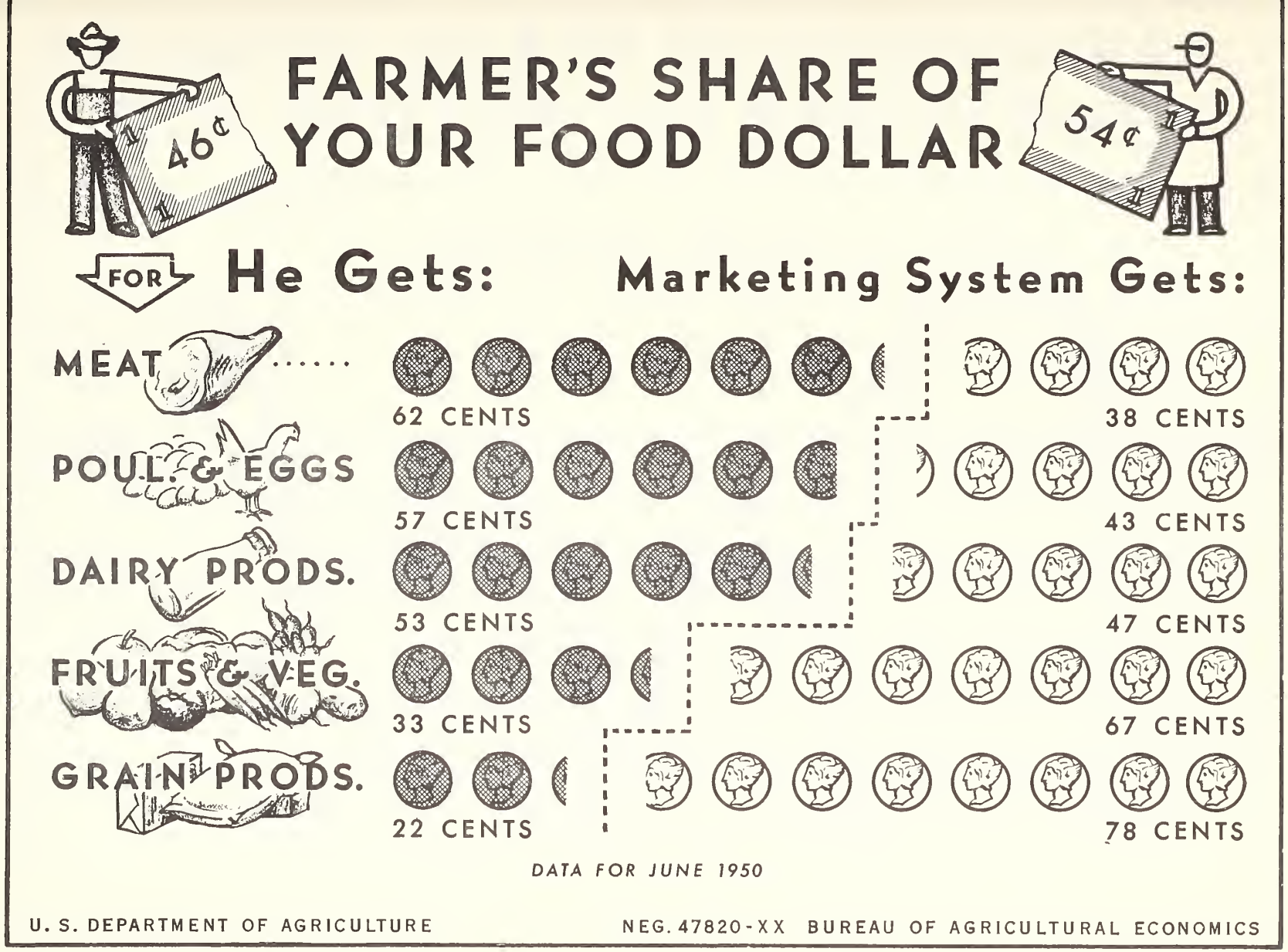

FARMER'S SHARE OF YOUR FOOD DOLLAR
46¢
54¢
FOR
He Gets:
Marketing System Gets:
MEAT
62 CENTS
38 CENTS
POUL. & EGGS
57 CENTS
43 CENTS
DAIRY PRODS.
53 CENTS
47 CENTS
FRUITS & VEG.
33 CENTS
67 CENTS
GRAIN PRODS.
22 CENTS
78 CENTS
DATA FOR JUNE 1950
U. S. DEPARTMENT OF AGRICULTURE
NEG. 47820-XX BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 16

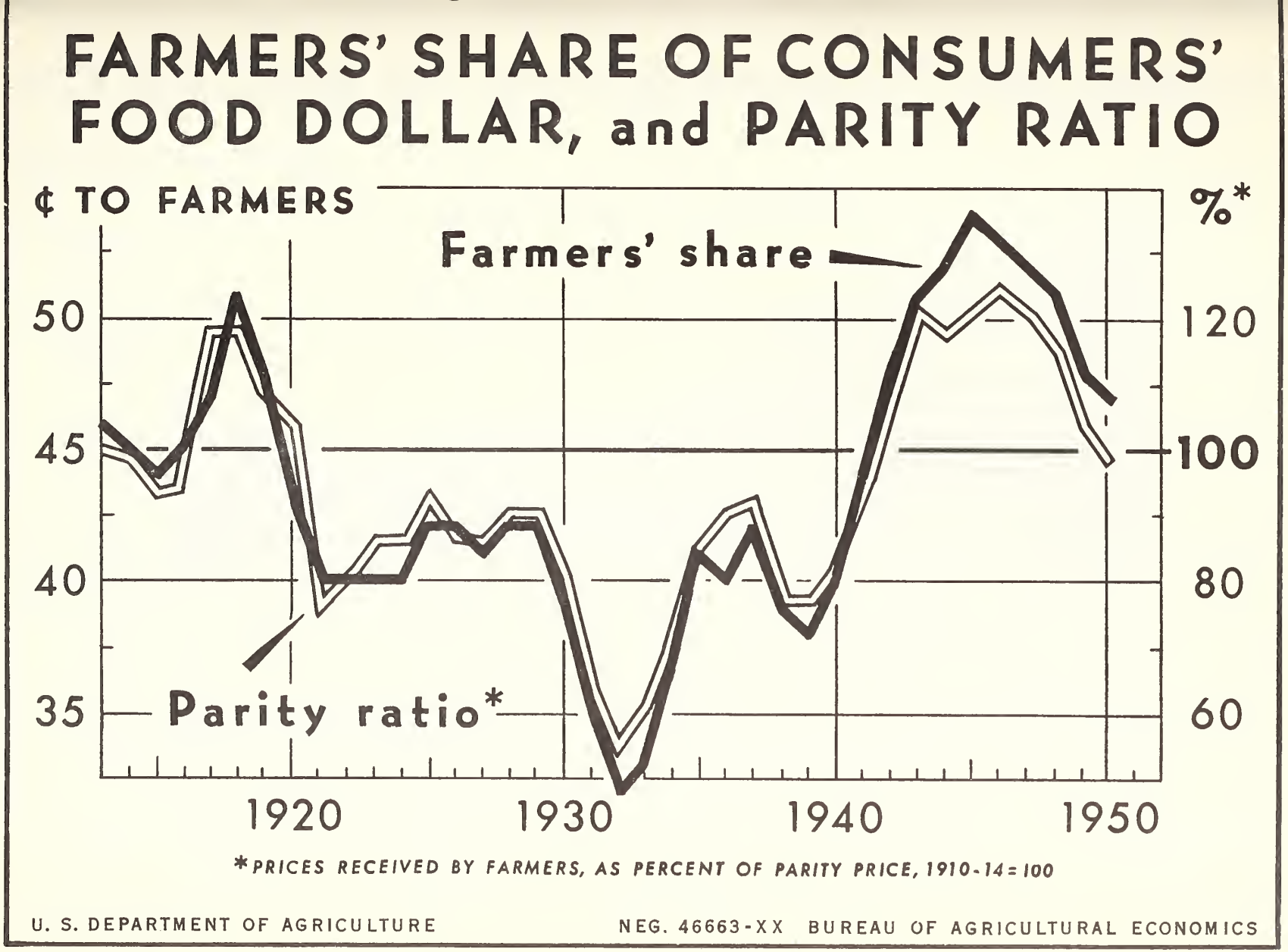

FARMERS' SHARE OF CONSUMERS' FOOD DOLLAR, and PARITY RATIO
¢ TO FARMERS
%*
Farmers' share
Parity ratio*
50
45
40
35
120
100
80
60
1920
1930
1940
1950
*PRICES RECEIVED BY FARMERS, AS PERCENT OF PARITY PRICE, 1910-14 = 100
U. S. DEPARTMENT OF AGRICULTURE
NEG. 46663-XX BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 17

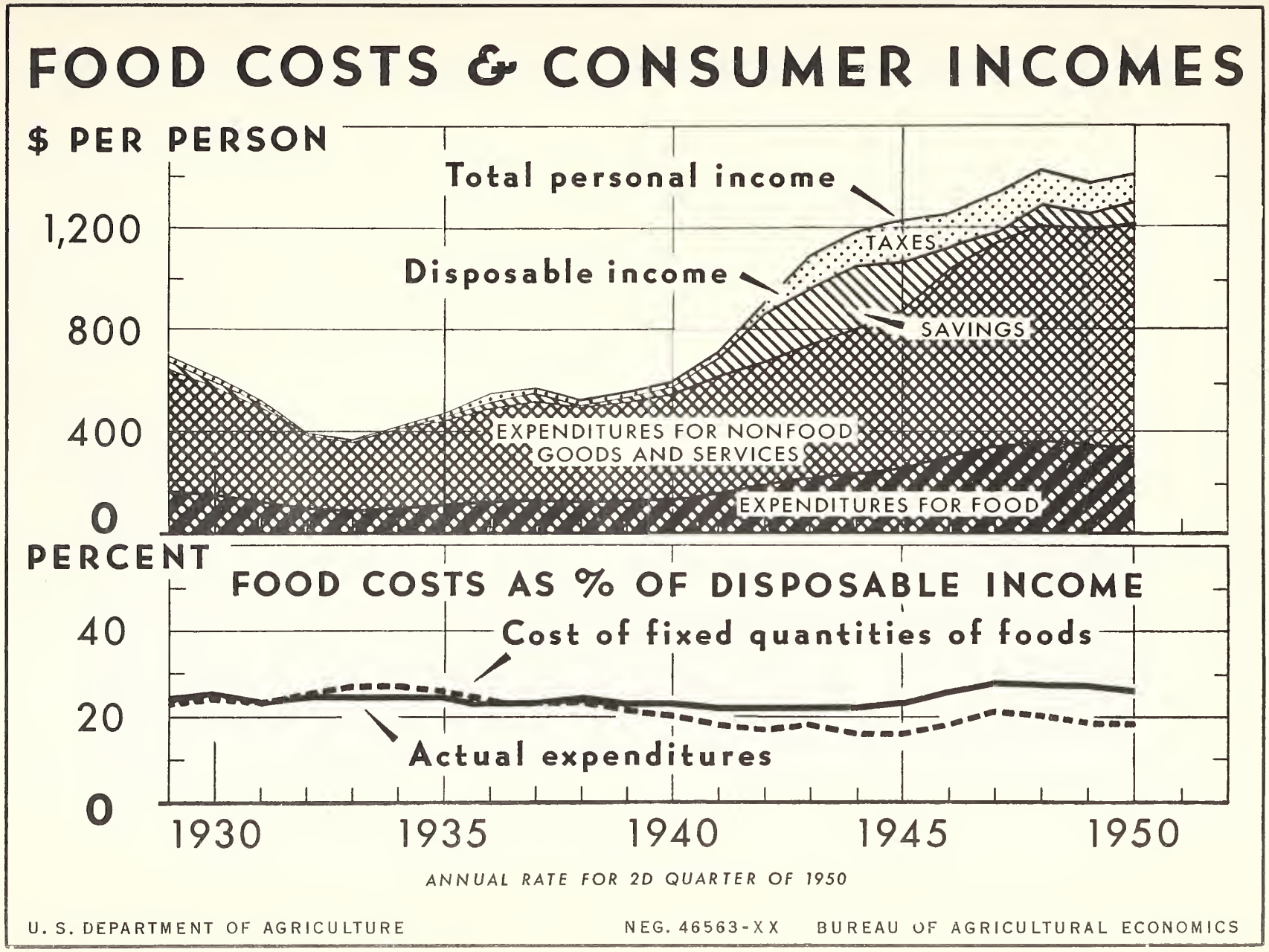

FOOD COSTS & CONSUMER INCOMES
$ PER PERSON
Total personal income
Disposable income
TAXES
SAVINGS
EXPENDITURES FOR NONFOOD GOODS AND SERVICES
EXPENDITURES FOR FOOD
1,200
800
400
0
PERCENT
FOOD COSTS AS % OF DISPOSABLE INCOME
Cost of fixed quantities of foods
Actual expenditures
40
20
0
1930
1935
1940
1945
1950
ANNUAL RATE FOR 2D QUARTER OF 1950
U. S. DEPARTMENT OF AGRICULTURE
NEG. 46563-XX
BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 18

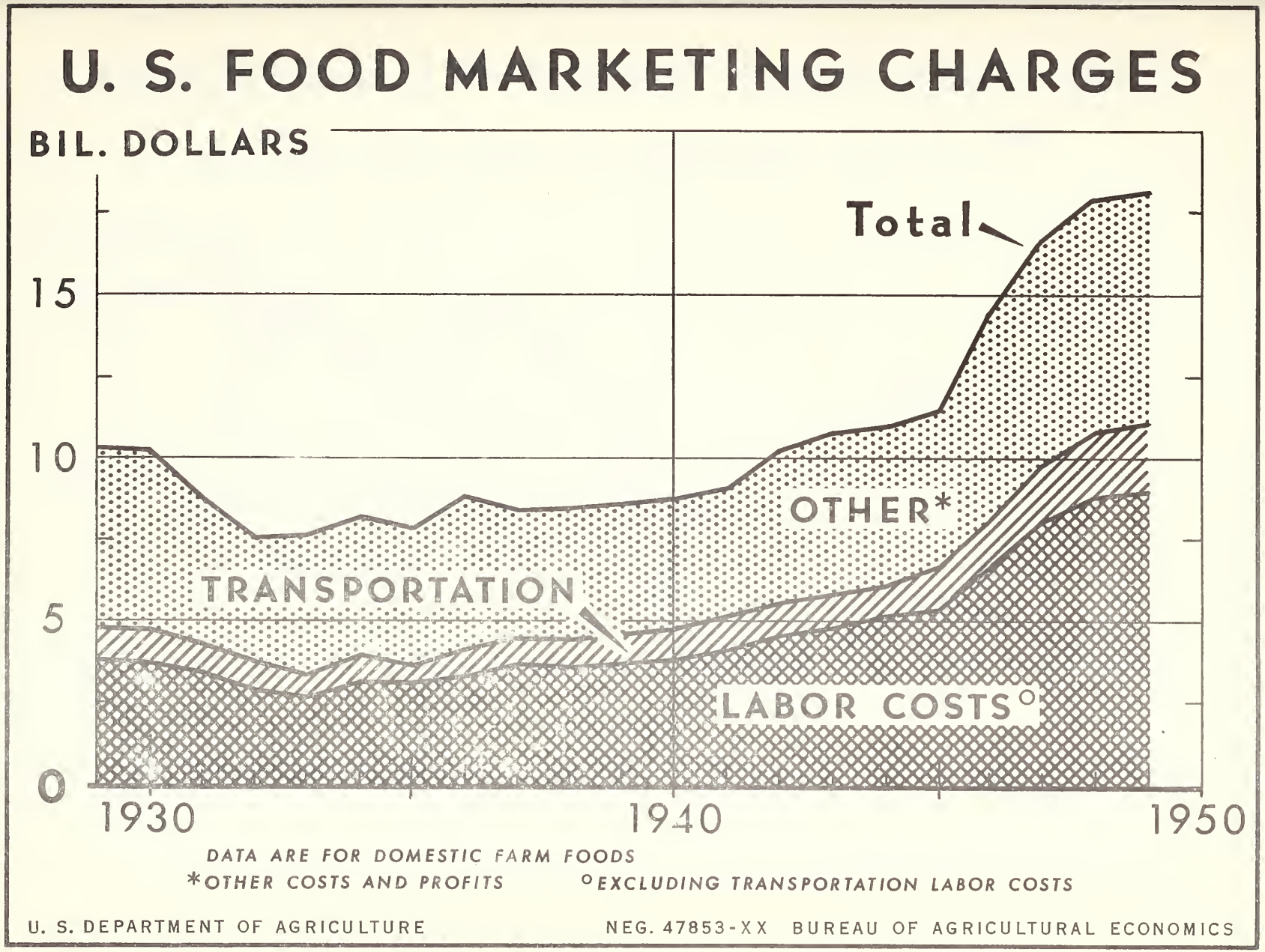

U. S. FOOD MARKETING CHARGES
BIL. DOLLARS
15
10
5
0
1930
1940
1950
Total
OTHER*
TRANSPORTATION
LABOR COSTS°
DATA ARE FOR DOMESTIC FARM FOODS
*OTHER COSTS AND PROFITS
°EXCLUDING TRANSPORTATION LABOR COSTS
U. S. DEPARTMENT OF AGRICULTURE
NEG. 47853-XX BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 19

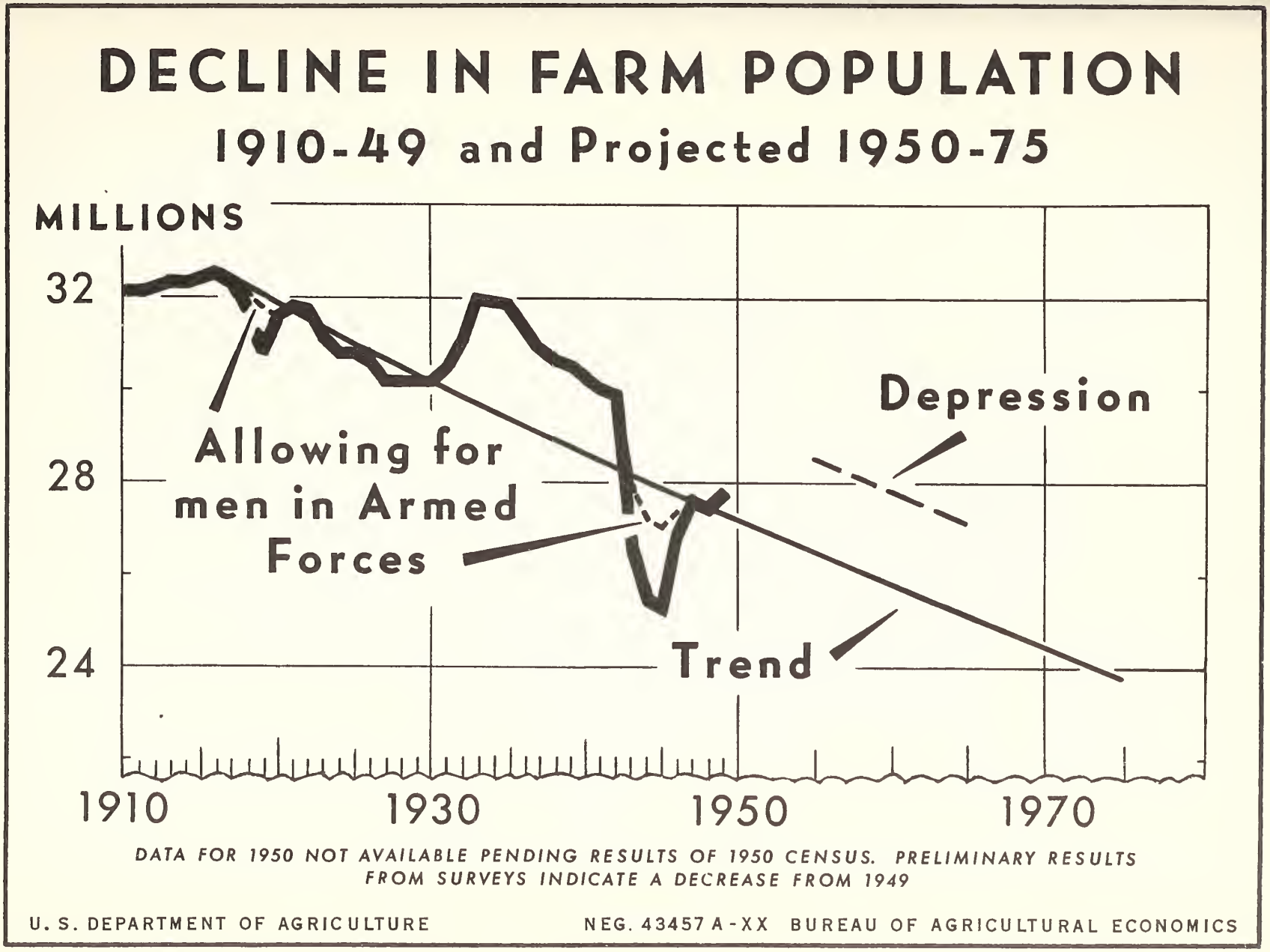
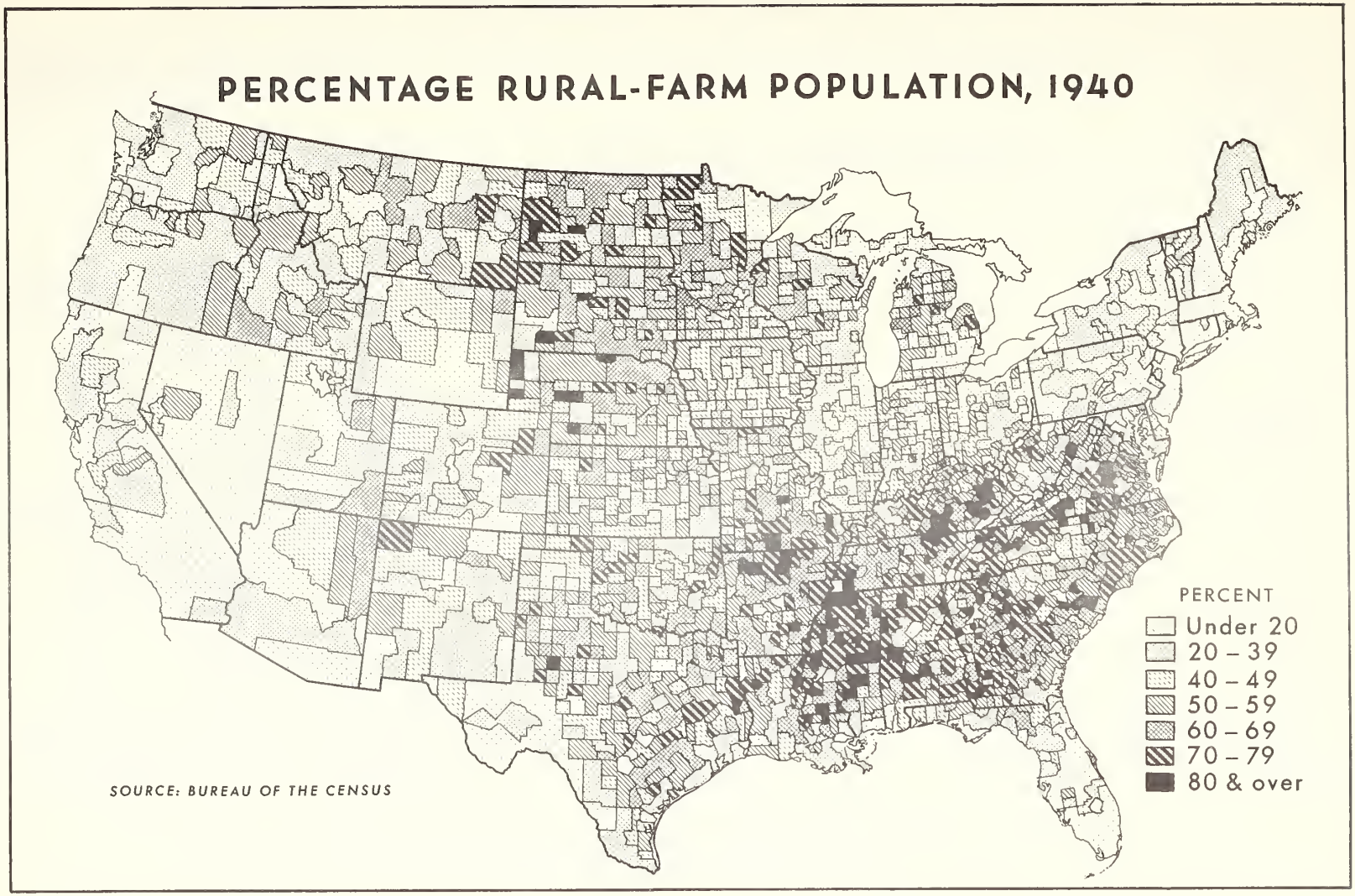

DECLINE IN FARM POPULATION
1910-49 and Projected 1950-75
MILLIONS
32
28
24
Allowing for men in Armed Forces
Depression
Trend
1910
1930
1950
1970
DATA FOR 1950 NOT AVAILABLE PENDING RESULTS OF 1950 CENSUS. PRELIMINARY RESULTS FROM SURVEYS INDICATE A DECREASE FROM 1949
U. S. DEPARTMENT OF AGRICULTURE
NEG. 43457 A-XX BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 20



U. S. DEPARTMENT OF AGRICULTURE NEG. 47412-X BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 21

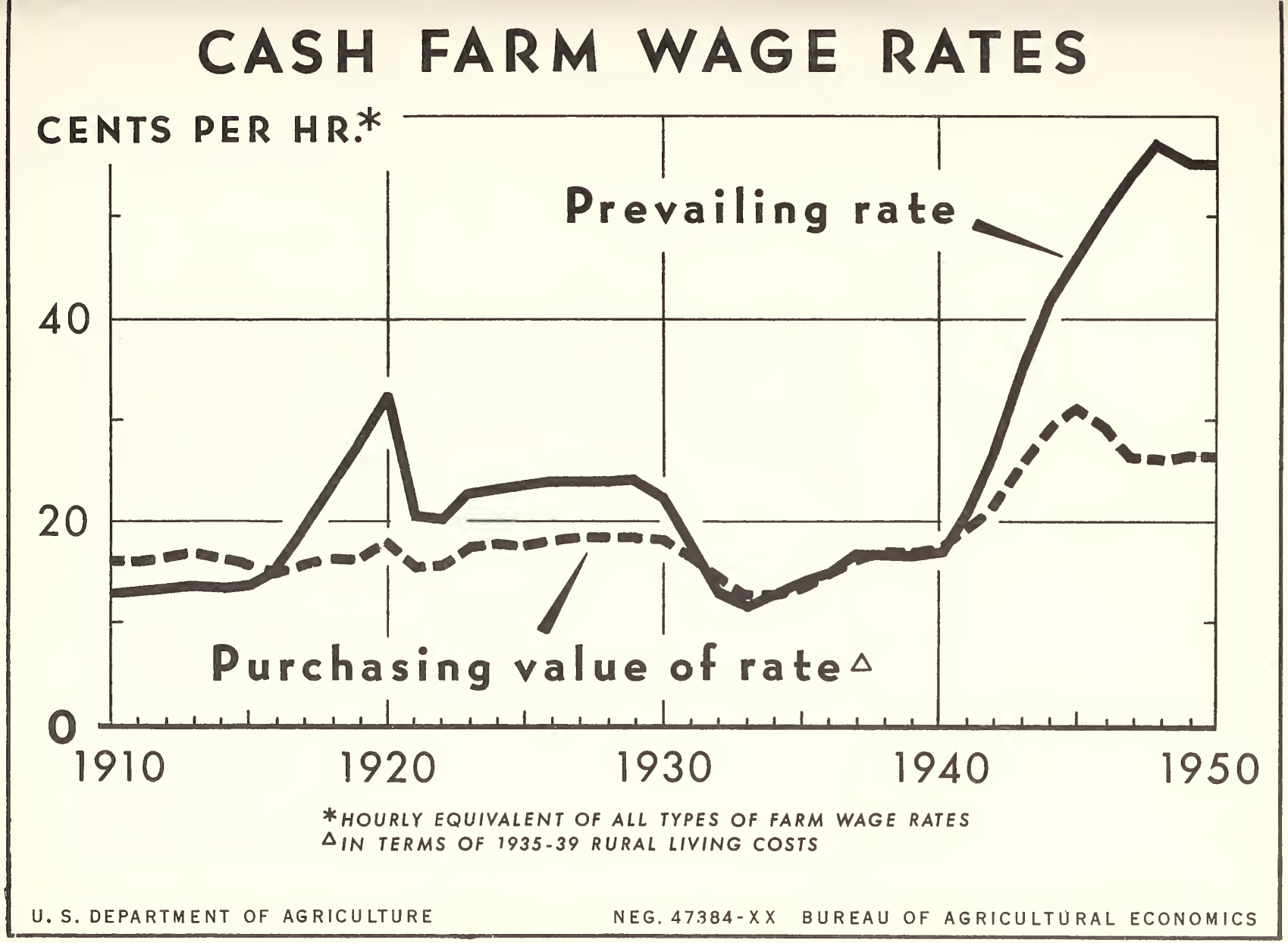

CASH FARM WAGE RATES
CENTS PER HR.*
Prevailing rate
Purchasing value of rate△
40
20
0
1910
1920
1930
1940
1950
*HOURLY EQUIVALENT OF ALL TYPES OF FARM WAGE RATES
△IN TERMS OF 1935-39 RURAL LIVING COSTS
U. S. DEPARTMENT OF AGRICULTURE
NEG. 47384-XX BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 22

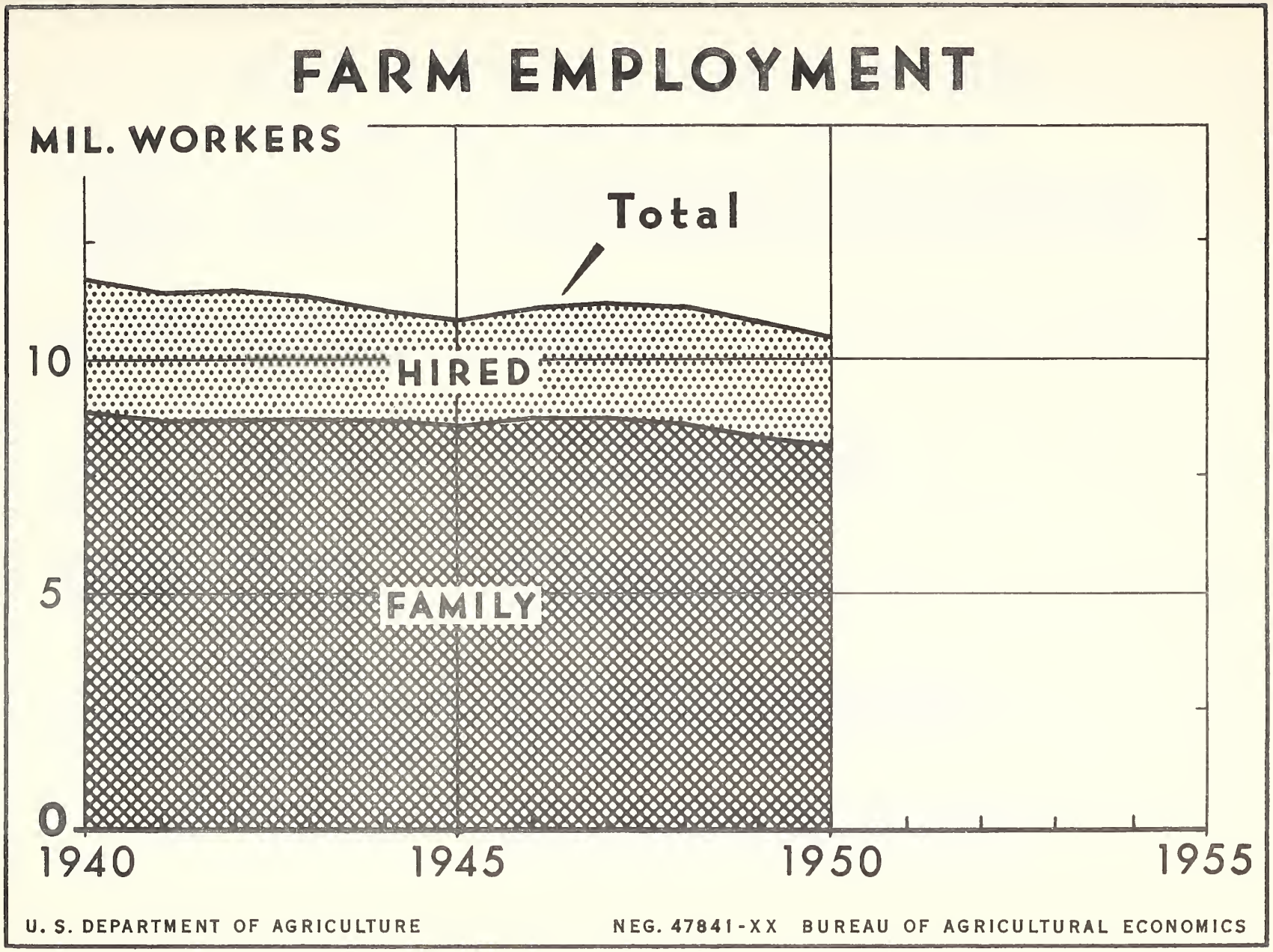

FARM EMPLOYMENT
MIL. WORKERS
Total
HIRED
FAMILY
10
5
0
1940
1945
1950
1955
U. S. DEPARTMENT OF AGRICULTURE
NEG. 47841-XX BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 23

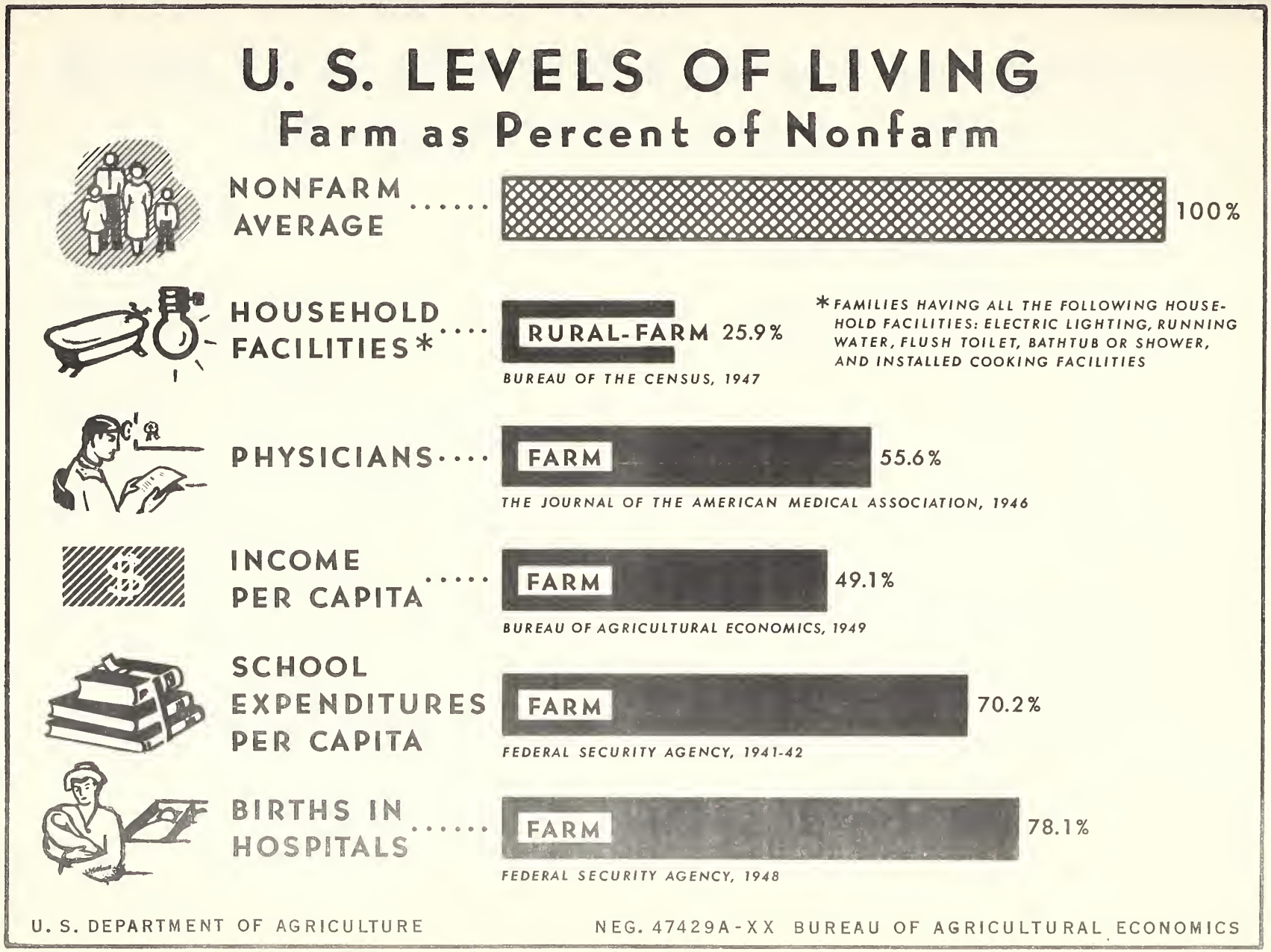
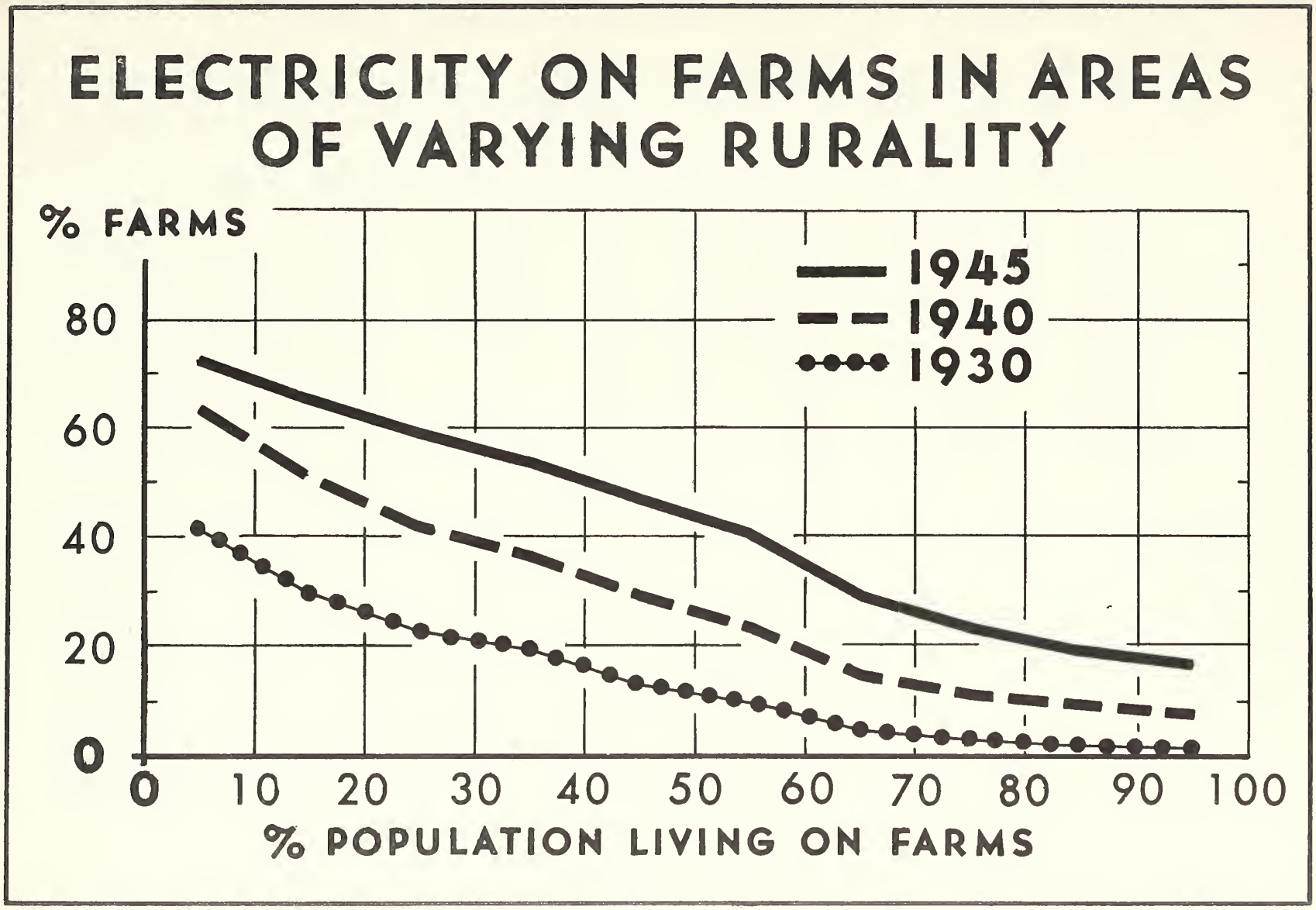

U. S. LEVELS OF LIVING
Farm as Percent of Nonfarm
NONFARM AVERAGE
100%
HOUSEHOLD FACILITIES*
RURAL-FARM 25.9%
BUREAU OF THE CENSUS, 1947
*FAMILIES HAVING ALL THE FOLLOWING HOUSEHOLD FACILITIES: ELECTRIC LIGHTING, RUNNING WATER, FLUSH TOILET, BATHTUB OR SHOWER, AND INSTALLED COOKING FACILITIES
PHYSICIANS
FARM
55.6%
THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 1946
INCOME PER CAPITA
FARM
49.1%
BUREAU OF AGRICULTURAL ECONOMICS, 1949
SCHOOL EXPENDITURES PER CAPITA
FARM
70.2%
FEDERAL SECURITY AGENCY, 1941-42
BIRTHS IN HOSPITALS
FARM
78.1%
FEDERAL SECURITY AGENCY, 1948
U. S. DEPARTMENT OF AGRICULTURE
NEG. 47429A-XX BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 24



U. S. DEPARTMENT OF AGRICULTURE NEG. 47408-XX BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 25

STATEMENT OF OBLIGATIONS UNDER ALLOTMENTS, WORKING FUNDS, AND TRUST FUNDS

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Research and Marketing Act of 1946 (Title II), Department of Agriculture, (Bureau of Agricultural Economics):			
Marketing research and service ...	$1,313,334	$1,225,000	$1,144,500
Flood Control, Department of Agriculture, (Bureau of Agricultural Economics):			
Research on economic aspects of flood control	21,132	30,000	27,000
Administrative Expenses, Section 392, Agricultural Adjustment Act of 1938, Department of Agriculture, (Bureau of Agricultural Economics):			
For statistical services in connection with wheat acreage allotments and marketing quotas	40,261	22,000	--
Working Fund, Agriculture, Bureau of Agricultural Economics, (General Account):			
Advanced from:			
Department of Agriculture:			
Studying family expenditures in selected counties in Montana (Bureau of Human Nutrition and Home Economics)	730	328	--
Participating in a wheat variety survey in wheat producing States (Bureau of Plant Industry, Soils, and Agricultural Engineering)	2,500	--	--
Furnishing cost-of-production data for various crops insured by the Federal Crop Insurance Corporation (Federal Crop Insurance Corporation)	81,164	118,836	--
Total, Department of Agriculture	84,394	119,164	--

(Continued on next page)

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Working Fund, Agriculture, Bureau of Agricultural Economics, (General Account): Continued			
Advanced from: Continued			
Bureau of the Census:			
Checking and correcting the information for lists of large farms furnished by the Bureau of the Census	18,150	--	--
Collecting basic data on prices received by farmers for specified crops and livestock products, and inventory values of specified livestock for use in connection with the 1950 Census	56,285	40,270	--
Total, Bureau of the Census	74,435	40,270	--
Bureau of Labor Statistics:			
Preparing the agricultural segment of the Inter-Industry Study	4,906	--	--
Federal Security Agency:			
For conducting a consumer survey	--	5,500	--
Total, General Working Fund	163,735	164,934	--
Working Fund, Agriculture, General, (Bureau of Agricultural Economics):			
Advanced from:			
Department of Defense, Department of the Army:			
Training Japanese agricultural leaders	--	100	--
Training German nationals in agricultural economics	277	--	--
To cover the cost of providing data in connection with a comprehensive survey of the Arkansas-White-Red River Basin	--	a/ 14,000	--
Department of State:			
Training German leaders in the field of agriculture under the reorientation program	886	14	--
Department of the Interior:			
Development of an evaluation of the agricultural repayment feasibility of the Weber Basin Reclamation Project, Utah	--	5,800	--

a/ Allotment as of December 31, 1950.

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Working Fund, Agriculture, General, (Bureau of Agricultural Economics): continued			
National Security Resources Board:			
Conducting an apparel wool survey	- -	1,750	- -
Total, Working Fund, Agriculture General	1,163	21,664	- -
Working Fund, Agriculture, Bureau of Agricultural Economics, Advanced from Commodity Credit Corporation (Trust Account):			
Collection of price and supply data on legume and grass seeds	1,413	37,587	- -
Collection of data on rice, beans, and peas	21,794	29,706	- -
Total, Trust Working Funds	23,207	67,293	- -
Miscellaneous Contributed Funds, Department of Agriculture, (Bureau of Agricultural Economics):			
Deposited by:			
Fruit Industry:			
Cooperative research with various contributors on marketing of fruits and fruit products	28,975	47,170	- -
Iowa State College:			
Cooperative work on research and statistical methodology	941	- -	- -
National Bureau of Economic Research:			
Cooperative study of agricultural financing	608	8,313	- -
University of Michigan:			
Cooperative work with the University of Michigan, to develop improved methods of gathering statistical information	42	- -	- -
University of Virginia:			
Cooperative work with the University of Virginia on factors associated with cotton yield variability	375	400	- -
Total, Miscellaneous Contributed Funds	30,941	55,883	- -

(Continued on next page)

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Expenses, International Development: Executive Office of the President (Allotment to Agriculture)(Bureau of Agricultural Economics): Participation in the program of cooperation with the American Republics	44,390	a/ 20,400	- -
Expenses of Defense Production, Executive Office of the President (Allotment to Agriculture)(Bureau of Agricultural Economics): For carrying out the provisions of the Defense Production Act of 1950	- -	a/ 25,000	- -
Foreign Assistance, Executive Office of the President (Allotment to Agriculture)(Bureau of Agricultural Economics): For carrying out the provisions of Section 112 of the Foreign Assistance Act of 1948	- -	3,358	- -
Expenses, Economic Cooperation Administration, Executive Office of the President (Allotment to Agriculture)(Bureau of Agricultural Economics): For expenses incident to the foreign trainee program	- -	5,100	- -
TOTAL, OBLIGATIONS UNDER ALLOTMENTS, WORKING FUNDS, AND TRUST FUNDS	1,638,163	1,640,632	1,171,500

a/ Allotment as of December 31, 1950.

PASSENGER MOTOR VEHICLES

It is anticipated that the Bureau will need to replace 11 passenger motor vehicles in the fiscal year 1952 at a net cost of $1,000 each, or a total of $11,000.

These 11 cars to be replaced constitute 23% of the total number of cars operated by the Bureau of Agricultural Economics. All of the automobiles proposed for replacement are within the replacement standards established by the Bureau of the Budget.

The 48 cars operated by the Bureau are used in the field by agricultural statisticians in the crop and livestock reporting service and by research specialists on farm management and land use.

AGRICULTURAL RESEARCH ADMINISTRATION

Purpose Statement

The Agricultural Research Administration was established by the Secretary of Agriculture on December 13, 1941. This action was confirmed by Executive Order No. 9069, issued February 23, 1942. The organization was continued without change under Reorganization Plan No. 1 of 1947. It is composed of the following units:

Office of Administrator (including the Agricultural Research Center)
Office of Experiment Stations
Bureau of Human Nutrition and Home Economics
Bureau of Animal Industry
Bureau of Dairy Industry
Bureau of Agricultural and Industrial Chemistry
Bureau of Plant Industry, Soils, and Agricultural Engineering
Bureau of Entomology and Plant Quarantine

Through these agencies the Administration carries on most of the Department's research in the physical and biological sciences. It operates the 12,000 acre Agricultural Research Center at Beltsville, Maryland where numerous research projects of the Department's bureaus, including some bureaus outside the Agricultural Research Administration, are under way. Much of the Administration's research is conducted in cooperation with the State agricultural experiment stations and with other research agencies, both public and private.

The Administration also conducts those control and regulatory programs of the Department which involve the enforcement of plant and animal quarantine, meat inspection, and the control of diseases and insect pests of animals and plants.

The Administration is responsible for the program of Federal-grant funds made available to the States for the operation of agricultural experiment stations and for the coordination and integration of research work under way in the Department with that of the State agricultural experiment stations.

A more detailed discussion of work performed is included in the statements prepared by the individual bureaus of the Administration.

OFFICE OF ADMINISTRATOR, ARA

The Office of Administrator, Agricultural Research Administration, includes scientific and administrative personnel engaged in planning, coordinating, and directing, in conjunction with Bureau chiefs, the research and regulatory programs of agencies within the Administration to assure effective utilization of resources and an integrated research program which, in the light of research conducted by other public agencies and private industry, is adapted to the changing needs of agriculture and the Nation's requirements for food, feed, and fiber.

Attached to the Office of Administrator, and subject to his supervision, is the Agricultural Research Center at Beltsville, Md., which provides facilities and services for many scientific investigations carried on by various agencies of the Department.

The Agricultural Research Administrator has the responsibility for coordinating all research work of the Department (other than economic) and administers specific related programs such as:

1. Research and Marketing Act
2. Federal research program on agricultural problems of Alaska
3. Research on strategic and critical agricultural materials

The staff included on November 30, 1950, 72 employees in Washington and 358 full-time and 56 part-time employees engaged in field activities, located principally at Beltsville, Md., and in Alaska.

	Estimated, 1951	Budget estimate, 1952
Appropriated funds:		
Salaries and expenses	$587,500	$587,000
Working Capital Fund, Agricultural Research Center	300,000	--
Research on agricultural problems of Alaska	280,000	280,000

AGRICULTURAL RESEARCH ADMINISTRATION
OFFICE OF ADMINISTRATOR

Appropriation Act, 1951	$600,000
Reduction pursuant to Section 1214	-5,000
Activities transferred in 1952 Estimates to "Salaries and expenses, Office of the Secretary of Agriculture," for employee health services at the Agricultural Research Center	-7,500
Base for 1952	587,500
Budget Estimate, 1952	587,000
Decrease (to provide a direct appropriation to the General Services Administration for certain procurement costs previously paid from this appropriation)	-500

PROJECT STATEMENT

Project	1950	1951 (estimated)	Decrease (GSA adjustment)	1952 (estimated)
1. Administration and overall direction of the Agricultural Research Administration	$363,130	$351,000	-$400	$350,600
2. Supervision of maintenance, operation, and furnishing of facilities and services at the Agricultural Research Center.	252,228	236,500	-100	236,400
3. Replacement of granary buildings and inventory destroyed by fire	148,009	- -	- -	- -
Unobligated balance	5,673			
Total available	769,040	587,500	-500	587,000
Transfer in 1951 Estimates from "Research and Marketing Act of 1946, Department of Agriculture"	-204,347	- -		
Transfer in 1952 Estimates to "Salaries and expenses, Office of the Secretary of Agriculture"	+7,307	+7,500		
Reduction pursuant to Sec. 1214	- -	+5,000		
Total appropriation or estimate	572,000	600,000		

CHANGE IN LANGUAGE

The estimates include proposed changes in the language of this item as follows (deleted matter enclosed in brackets):

> For necessary expenses of the Office of Administrator, including [the purchase of one passenger motor vehicle,] travel and subsistence expenses of advisory committees authorized by title III of the Act of August 14, 1946 (7 U.S.C. 1628-1629), and the maintenance, operation, and furnishing of facilities and services at the Agricultural Research Center, * * * * *

The proposed change in language is for the purpose of eliminating the authority provided in the 1951 Appropriation Act for the purchase of one passenger motor vehicle, as retention of this authority will not be necessary in fiscal year 1952.

STATUS OF PROGRAM

1. Administration and Over-all Direction of the Agricultural Research Administration:

The Administrator, with the assistance of his immediate staff, is responsible for planning, coordinating, and directing the research program and the control and regulatory programs of the Agricultural Research Administration; coordinates all research activities (other than economic research) of the other agencies of the Department; and develops, in cooperation with directors of State and Territorial Agricultural Experiment Stations and 20 RMA advisory committees, and in the light of research conducted by other public agencies and private industry, an integrated research program which will best meet the changing needs of agriculture and the Nation's requirements for food, feed, and fiber.

The major activities in 1950 were:

a. Functions previously performed by the Administrator, Research and Marketing Act, were transferred to the Agricultural Research Administration on July 30, 1949. In carrying forward this assignment established procedures were modified and adapted to further integrate the coorination of research activities. Particular effort has been devoted to implementing recommendations of functional and commodity advisory committees. The members of these committees collaborate with and advise the Department on the formulation of research, marketing service, and marketing educational programs. Twenty-one Advisory Committee meetings were held during the year. Members of the staff served as Executive Secretaries to the Committees, arranged for the required facilities, prepared condensed progress reports on selected work of interest to each committee, listed problems or fields of work for their consideration, secured participation by Departmental specialists, recorded the actions taken and the recommendations made, and prepared and distributed the final reports approved by the Committees.

The Executive Secretaries of Advisory Committees, also kept committee members currently informed of the results of research by forwarding publications and special reports as they became available. Contacts were maintained with special industry or commodity groups to inform them of progress in their fields of interest. While these committees were originally established to advise the Department on programs carried out with Research and Marketing Act funds, efforts are being made to extend the advisory committee system to the Department's entire program in the fields of research and marketing service.

b. Research panels devoted attention to special fields of work, evaluating research needs on (1) brush control and pasture and range improvement and management, (2) supplemental irrigation in the humid region, and (3) production and management of the short leaf-pine-hardwood forest type. The establishment of such panels promotes broad and coordinated attacks on important agricultural problems. Members of the staff also serve as chairmen to approximately 20 working groups of technical subject-matter specialists within the Department.

c. The Research Administrator served as a member of the interagency committee which developed U. S. recommendations as to FAO policies and opportunities, and as Chairman of the FAO International Standing Committee on Agriculture. He is a member of the Interdepartmental Committee on Scientific Research and Development and members of the Administrator's staff served on the Subcommittees on Scientific Personnel and on Budgetary Procedures. Staff members also served on many important committees such as the Advisory Committee for Scientific Research of the Textile Research Institute, the Department's Committee on Foreign Agricultural Policy, the Food and Nutrition and the Agricultural Boards of the National Research Council, the Federal Government's Patents Board, the National Forest Advisory Board of Appeals; and as consultants to the Atomic Energy Commission, to the Research and Development Board and the Munitions Board of the Department of Defense.

d. The Central Project Office was staffed and equipped for full operation, performing four essential functions: (1) it serves as a central control for routing and clearance of all actions on projects in the fields of research, marketing service, and statistics; (2) it maintains by means of comprehensive agency and subject-matter files a readily available store of information on about 3,200 current Departmental projects in these fields; (3) it prepares descriptive analyses of the current research program of the Department, both as a whole and in particular commodity or functional fields, for the purposes of revealing points of over- and under-emphasis, possible duplication of effort, and opportunities for cooperative endeavor among different agencies; and (4) it prepares descriptive summaries of research in particular fields for the use of advisory committees, research workers in the Department and in State agricultural experiment stations, research coordinators, and others.

The following figures indicate the measurable 1950 workload of the project office:

Items added to the files:

Financial projects	22
Work projects	167
Line projects	958
Active line projects extended	213
Line projects discontinued	186

e. The Department's research on the agricultural problems of Alaska continued to be a direct responsibility of the Administrator and was carried out in accordance with the intent of Congress, expressed in the 1950 Agricultural Appropriation Act, as a joint Federal-Territorial program cooperative with the Experiment Station of the University of Alaska. This Office also continued to serve as the planning and coordinating agency for the Department's research on strategic and critical agricultural materials for the Munitions Board, and to plan the research program carried out under the Special Research Fund.

2. Supervision of Maintenance, Operation and Furnishing of Facilities and Services at the Agricultural Research Center

The Agricultural Research Center furnished facilities and services to agencies conducting research at the Center as follows: upkeep of Center grounds; furnishing guards and 24-hour telephone service; operation of mail and messenger service; health unit and emergency first aid service; fire protection; construction and maintenance of roads; operation of sewage disposal plant and system; operation of water treatment plant; and performance of administrative services in connection therewith.

Reimbursable services were furnished to ten bureaus of the Department and several other government agencies conducting research and experimental work at the Center. These services included heat, electricity, gas and water; maintenance, construction and repair of structures and equipment; mechanical shop services; engineering services; general farm work; and supplies as requested by the bureaus. Reimbursable work amounted to approximately $2,000,000 during the fiscal year 1950. A major construction job was the rebuilding of the Center's granary, previously destroyed by fire.

Following are some examples of the Center's operations:

Sewage treated	201,580,000 gallons
Water supplied	239,243,800 gallons
Electricity purchased and distributed	8,803,000 K.W.H.
Steam furnished for heating	38,150,526 pounds
Steam furnished to laboratories	15,996,897 pounds
Grains and concentrates mixed in accordance with experimental feeding formulas (only 3 months operation due to Granary fire)	1,334 tons

Coal purchased and delivered to heating plants	10,063 tons
Fuel oil purchased and delivered ...	360,636 gallons
Requests for mechanical and automotive shop services	5,195
Acres on which farm and field work was performed	2,500

The 1951 General Appropriation Act, provided a working capital fund of $300,000 which henceforth will facilitate the financing of services rendered bureaus at the Center pending reimbursement. Supervisory functions will continue to be financed by funds from the direct appropriation made to the Office of the Administrator.

STATEMENT OF OBLIGATIONS UNDER ALLOTMENTS AND WORKING FUNDS

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Research and Marketing Act of 1946 (Title II), Department of Agriculture (Office of Administrator, Agricultural Research Administration):			
Over-all administration, planning, and coordination of research under Title II of the act of June 29, 1935 as amended	$79,319	$109,000	$109,000
Inventory and analysis of research, marketing, and statistical projects	23,854	16,000	12,000
Total, Research and Marketing Act	103,173	125,000	121,000
Working Fund, Agriculture, General (Office of Administrator, Agricultural Research Administration):			
Advanced from:			
Department of Defense, Department of the Army:			
For sponsoring, planning, and administering training programs in the general field of agriculture for agricultural leaders of occupied countries	357	43	—
Department of State:			
For sponsoring, planning, and administering training programs in the general field of agriculture for agricultural leaders of occupied countries	700	—	—
Total, Working Fund, Agriculture, General	1,057	43	—

(Continued on next page)

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Expenses, International Development, Executive Office of the President (Allotment to Agriculture) (Office of Administrator, Agricultural Research Administration): For assisting Latin and South American visitors and trainees interested in agricultural research	10,939	a/ 6,500	- -
Expenses, Economic Cooperation Administration, Executive Office of the President (Allotment to Agriculture) (Office of Administrator, Agricultural Research Administration): For expenses incident to the foreign trainee program	- -	35,400	- -
TOTAL, OBLIGATIONS UNDER ALLOTMENTS AND WORKING FUNDS	115,169	166,943	121,000

a/ Allotment as of December 31, 1950.

WORKING CAPITAL FUND, AGRICULTURAL RESEARCH CENTER

Appropriation Act, 1951	$300,000
Budget Estimates, 1952	- -
Decrease (to eliminate non-recurring provision in 1951 Act for a working capital fund to finance reimbursable operations) .	-300,000

CHANGE IN LANGUAGE

The estimates propose deletion of language for this item as follows:

> [Working capital fund, Agricultural Research Center: For the establishment of a working capital fund, to be available without fiscal year limitation, for expenses necessary for furnishing facilities and services by the Agricultural Research Center to Government agencies, $300,000. Said fund shall be reimbursed from applicable appropriations or other funds to cover the charges for such facilities and services, including handling and related charges, for equipment rentals (including depreciation, maintenance, and repairs), for supplies, equipment and materials, stores of which may be maintained at the Center, and for building construction, alterations, and repair, and applicable appropriations or other funds may also be charged their proportionate share of the necessary general expenses of the Center not covered by the annual appropriation.]

This language change proposes deletion of the appropriation, provided in the 1951 Appropriation Act, establishing a non-expendable Working Capital Fund for financing certain facilities and services furnished other agencies at the Agricultural Research Center pending receipt of reimbursements. Retention of the language is no longer required.

A commercial type accounting system has been established to reflect, on an accrual basis, the accurate cost for each operation, including labor, material, overhead, depreciation, utilities and services involved. Experience to date has been fully satisfactory and establishment of the fund represents a significant improvement over the previous system of advance reimbursement for services rendered.

RESEARCH ON STRATEGIC AND CRITICAL AGRICULTURAL MATERIALS

Purpose Statement

The Strategic and Critical Materials Stock Piling Act of July 23, 1946, in section 7(b), authorizes and directs the Department of Agriculture to make scientific, technologic, and economic investigations of the feasibility of developing domestic sources of supplies of any agricultural material or substitutes for such materials determined by the Munitions Board to be strategic and critical. This appropriation is for the purpose of enabling the Department to carry out its responsibilities under that Act.

This program is administered by the Agricultural Research Administration. The Munitions Board, however, recommends or approves investigations to be undertaken. Funds are allotted to those research agencies of the Department which are best equipped to carry out the investigations required.

Investigations are at present being conducted on rubber, tannin, vegetable oils, and materials for cordage.

	Estimated, 1951	Budget estimate, 1952
Appropriated funds	$399,000	$700,000

Appropriation Act, 1951	$399,000
Budget Estimate, 1952	700,000
Increase	+301,000

SUMMARY OF INCREASES AND DECREASES, 1952

Decrease to eliminate a non-recurring provision in the 1951 Act for alterations and purchase of equipment to provide pilot plant facilities for tannin extraction studies at the Eastern Regional Research Laboratory	-50,000
For pilot plant investigations on the extraction of tannin from canaigre ($50,000 non-recurring)	+125,000
To expand production of canaigre for pilot plant tests, and to increase seed supplies	+9,200
To develop replacements for specific applications of stockpiled strategic oils	+182,300
For production research on hard fiber plants and hard fiber substitutes for cordage	+35,000
Decrease due to providing a direct appropriation to the General Services Administration for certain procurement costs previously paid from this appropriation	-500

PROJECT STATEMENT

Project	1950	1951 (estimated)	Increase or decrease: GSA adjustment	Increase or decrease: Other	1952 (estimated)
1. Research on domestic production of natural rubber	$207,086	$212,000	-$300	- -	$211,700
2. Investigations of domestic production of vegetable tannins	38,061	91,000	-200	+$84,200(1)	175,000
3. Investigations on vegetable oils	41,376	34,000	- -	+182,300(2)	216,300
4. Investigations on hard fiber plants for cordage	48,684	62,000	- -	+35,000(3)	97,000
Unobligated balance	18,793	- -	- -	- -	- -
Total appropriation or estimate	354,000	399,000	-500	+301,500	700,000

INCREASES AND DECREASES

(1) An increase of $84,200 under the project "Investigations of domestic production of vergetable tannins" consisting of:

(a) A decrease of $50,000 to eliminate a non-recurring provision in the 1951 Act for alterations and purchase of equipment to provide pilot plant facilities for tannin extraction studies at the Eastern Regional Research Laboratory (Bureau of Agricultural and Industrial Chemistry)

(b) Increase of $125,000 for pilot plant investigations on the extraction of tannin from canaigre (Bureau of Agricultural and Industrial Chemistry)

Need for Increase: Vegetable tannins are derived from barks, woods, leaves, roots and fruits of plants. They are essential for the production of leather, which is one of the most critical war materials as well as an essential in civilian life. The average annual consumption of vegetable tannins is about 200 million pounds, of which more than two-thirds is imported. Chestnut wood represents the principal domestic source (over 90% of the total) and since practically all commercial stands of this tree have been killed by blight there is no prospect of any future substantial or sustained increase in tannin production from this source. We are thus becoming increasingly dependent on foreign sources for our tannin supplies and in the interest of our national welfare it is highly important that steps be taken to expedite the development of new domestic sources.

A planned program of research on the development of tanning materials has been in operation in the Department of Agriculture for several years. In this program principal attention has been devoted to canaigre and sumac as tanning crops. Canaigre, a perennial native of the Southwestern States, produces a root containing 20 to 25 per cent of tannin suitable for making heavy leather, although extraction of tannin cannot be done by conventional methods. Laboratory scale work has shown that the tannin in canaigre can be extracted satisfactorily but the method is radically different from those employed by industry for tannin manufacture. The process must therefore undergo further study on a larger scale to determine its commercial value.

Plan of Work: During the current fiscal year funds have been provided to modify existing facilities at the Eastern Regional Research Laboratory and to procure some of the necessary pilot plant equipment to carry out chemical engineering studies on the extraction of tannin from canaigre. In 1952 necessary additional equipment would be procured and installed. Chemical engineering studies would be undertaken to adapt the new and unconventional tannin extraction process to large scale operations. The work would be done on a scale large enough to determine the technical feasibility and operation costs of the process. In addition, a quantity of canaigre tannin sufficient to permit semi-commercial tanning tests would be prepared.

(c) Increase of $9,200 to expand production of canaigre for pilot plant tests and to increase seed supplies (Bureau of Plant Industry, Soils, and Agricultural Engineering)

Need for Increase: In order to produce enough tannin for commercial scale tests by leather manufacturers of the usefulness of canaigre tannin for sole leather processing, it will be necessary to grow about double the quantities of canaigre roots that can be harvested from plantings financed with currently available funds. Two years is required to grow the crop from seed. Current funds permit growing approximately 30 to 35 acres, which has been sufficient for laboratory test work, but approximately 60 acres will be required for pilot plant operations. In order to determine the most suitable locations for growing the crop, plantings of 2 to 5 acres have been made at each of six locations, 4 in Arizona, 1 in New Mexico and 1 in Texas. Current production is around 8 tons per acre. Experience gained in growing the crop indicates that it should be possible to increase yields to more than 12 tons per acre.

In addition to providing the quantities of roots required for processing tests, additional work is needed to determine the best locations for growing canaigre, develop and maintain the best planting stocks available, work out procedures for handling canaigre as a farm crop, and build up a supply of seed for rapid expansion of plantings in case of emergency. Approximately 150 pounds of seed can be harvested per acre the second year, whereas only around 2 pounds of seed per acre are required for planting. The seed is viable for 2 to 3 years.

Plan of Work: The present staff is sufficient to plan and supervise an expanded program, if sufficient labor, supplies, and acreage can be made available. Under the expanded program, contracts with farmers would be arranged for production of the 30 additional acres required, probably at approximately two locations where the operations have been most promising. It will be necessary to supervise the farmers' production and to provide temporary labor and funds to harvest and transport the roots to driers. Seed will also be harvested and stored for emergency production.

(2) An increase of $182,300 under the project "Investigations on vegetable oils" to develop replacements for specific applications of stockpiled strategic oils (Bureau of Agricultural and Industrial Chemistry)

Need for Increase: Castor oil, palm oil, coconut oil, and sperm oil are classed as strategic and critical materials because of their importance in many industrial processes and military applications. Each of these stockpiled oils has several important applications. By studying the performance of the strategic oils for various end uses, the chemical and physical properties that need to be provided in satisfactory replacements can be determined. The general objective of the proposed investigations is to develop from domestically available animal and vegetable fats and oils, materials that will replace strategic stockpiled oils in the following specific applications: sebacates from castor oil in lubricants, greases, and tough filament nylon; dehydrated castor oil in paints and varnishes; coconut oil as a source of dodecyl mercaptan for general purpose rubber; coconut oil in preparation of Navy disinfectants; and palm oil in tin plating and cold rolling of steel. The newly developed products would also be tested under commercial conditions to facilitate transition from strategic oils in the event of an emergency.

Plan of Work: Studies would be conducted on the chemical modification of domestically available animal and vegetable fats and oils by processes such as fractional crystallization and distillation, oxidative splitting, dehydrogenation, catalytic reduction, hydroxylation, and esterification, to convert these raw materials into modified and derived products which will be suitable replacements for specific end uses now met by castor, palm, coconut, and sperm oils.

(3) Increase of $35,000 under the project "Investigations on hard fiber plants for cordage" for production research on hard fiber plants and hard fiber substitutes for cordage (Bureau of Plant Industry, Soils, and Agricultural Engineering)

Need for Increase and Plan of Work: The Munitions Board has recommended that the Department's current investigations of the production of hemp, phormium, and sansevieria fibers for cordage be expanded over substantial areas. In past World Wars, the United States has been seriously short of supplies of strategic cordage fiber, and these three plants offer the best domestic sources for cordage fibers.

Hemp (increase of $15,000) is the best adapted cordage fiber crop for suddenly expanded domestic production on a large scale. In World Wars I and II, domestic hemp production was greatly expanded under government encouragement but at a cost of many millions of dollars. In 1943, hemp was produced on 176,000 acres, but by 1949 the acreage was down to 4,400. There is considerable criticism of the quality of hemp fiber produced in the United States. This is due to present retting methods, and growing hemp on soil high in nitrogen, which produces a coarse fiber.

Currently available funds (an initial allotment of $11,000 in fiscal year 1951) are required for hemp seed storage studies to prolong the viability of seed, and for some agronomic studies with small experimental plots at several locations to test production in lower nitrogen content soils and determine the best locations for production. In order to evaluate properly the production of these plots, quality tests of the fiber produced should be made in the laboratory in addition to the weighing and measuring tests made in the field. Also there is need for retting studies to improve fiber quality. Hemp retting in the United States has been done by "dew retting", where the stems are spread in the fields to be acted upon by fungi. The fungi require moisture which is furnished by dews and rain. Because of uncertain weather, however, a relatively poor quality of hemp has been produced. In certain parts of the world, hemp is retted in tanks of water where conditions can be controlled, and hemp of higher quality is produced. This type of retting should be studied for use in the United States.

Phormium (increase of $10,000), a leaf fiber similar to sisal, produces large yields of fiber under favorable conditions in sub-tropical to temperate climates. It has been grown as an ornamental plant in parts of California and Oregon for some years. Field studies during fiscal year 1950 have indicated that it may be adapted to a much wider range of soil and climatic conditions in California than was originally thought. It has been found that it will do well on hill slopes and less valuable agricultural lands than on the alluvial soils and small delta areas along the Pacific coast. There is need to set out thousands of phormium seedlings on the hillsides of Federal, State, and private holdings not now in commercial or useful production in order to provide a crop that could be harvested in an emergency or when economic conditions would indicate that it was profitable.

Sansevieria (increase of $10,000), which is adapted for field production in Florida, produces a fiber which makes an excellent rope. Tests by the Navy show it to be the best domestic substitute for abaca. Studies are being conducted in Florida on the breeding and culture of sansevieria to decrease production costs and improve fiber quality but there is need for additional laboratory work in testing

fiber quality of the larger number of plant materials now being developed by the breeding and improvement program. There is also an urgent need for increased plantings for study of commercial scale production problems and to provide root material for any rapid expansion that might be necessary in an emergency.

CHANGE IN LANGUAGE

The estimates include a proposed change in the language of this item as follows (deleted matter enclosed in brackets):

> For expenses necessary to enable the Secretary to carry out his responsibilities under section 7 (b) of the Strategic and Critical Materials Stock Piling Act of July 23, 1946 (50 U. S. C. 98f), [$399,000, including not to exceed $30,000 for alterations at the Eastern Regional Research Laboratory, Wyndmoor, Pennsylvania, to provide pilot plant facilities for tannin extraction, and such amount shall be in addition to amounts otherwise available for alterations]

This change is proposed to eliminate the non-recurring provision in the 1951 Appropriation Act for alterations in connection with pilot plant facilities for tannin extraction at the Eastern Regional Research Laboratory, as these alterations will be completed with 1951 funds.

STATUS OF PROGRAM

This appropriation enables the Department of Agriculture to carry out its responsibilities under the Strategic and Critical Materials Stock Piling Act of July 23, 1946. This Act authorizes and directs the Department to make scientific, technologic, and economic investigations of the feasibility of developing domestic sources of supplies of any agricultural material or substitutes for such materials determined by the Munitions Board to be strategic and critical. Investigations are undertaken only upon recommendation of the Munitions Board.

Current activities include research on domestic rubber production, tannin, strategic oils, and fiber plants, as follows:

1. Rubber production investigations are carried on in California and Texas to test means of quickly and inexpensively establishing field stands of guayule, the testing and hybridization of new strains to increase the yield of natural rubber, the development of the best methods of recovering rubber from the guayule plant, and the deresination of such rubber to improve quality.

2. Tannin investigations are at present devoted to the possible production of tanning materials from crops that can be produced in the United States, with special reference to sumac and canaigre. Pilot plant facilities are being provided to make possible semi-commercial tests of new processes for extracting tannin from canaigre, and to provide sufficient canaigre-tannin for commercial tests by industry.

3. Current work on strategic vegetable oils is devoted to improvements in the production of the castor bean plant, including the development of varieties adapted for commercial handling.

4. Studies in the field of strategic cordage are directed toward the domestic production of hard fibers (sansevieria, phormium, and hemp) that can be used for such purposes as lines and ropes on naval vessels.

Selected Examples of Recent Progress

1. Nursery costs of guayule have been cut to one-tenth of World War II costs. The development of furrow irrigation in guayule nurseries has reduced the cost of producing seedlings for transplant from the wartime level of $3.00 per thousand to a present estimated level of $.30 per thousand.

2. Guayule hybrids retained their superior rubber yielding characteristic in the third year of production. During the first, second, and third years of production, the better interspecific hybrids have yielded on the average 40 per cent more rubber than the best strains of straight guayule. These hybrids are being used in back-crossing with guayule to give even further increases in rubber yield.

3. Quality improvement of guayule rubber. Recent tests have shown that the best quality of guayule rubber can be obtained from a combination of immediate grinding of freshly harvested shrub and solvent deresination of the ground shrub prior to pebble milling for the recovery of rubber. Tests conducted by a large rubber manufacturer have indicated that such rubber is equal in quality to natural rubber from the Orient for many commercial applications. The possibility of deresination of the rubber after pebble milling is also under test. The use of hot solvent with agitation under carefully controlled conditions has been found promising and may result in a more economical method than deresination of the shrub prior to milling.

4. Development of continuous milling for recovery of rubber. The conventional process for recovery of guayule rubber has heretofore been unsatisfactory as to efficiency and cost. New continuous pilot-plant scale equipment units, promising significant reductions in processing costs are being assembled for further research on process development.

5. Field plantings of canaigre established. Canaigre plantings ranging in size from 2 to 5 acres have been established at six locations in Arizona, New Mexico, and Texas to determine and demonstrate methods of growing, handling, and harvesting canaigre as a farm crop and to furnish roots for extraction and tanning tests. Much basic agronomic information has been gained which will be used as a guide in establishing additional plantings to increase the plant stock reserves and to develop methods of crop handling in the several areas.

6. Higher tannin yielding canaigre varieties are probable. Wild canaigre plants collected recently in Western States promise new canaigre strains with higher tannin content and higher root yield. Several contain more than 40 per cent tannin in the roots, and under cultivation should yield substantially more tannin per acre than strains now available.

7. Prospects are good for efficient production of castor beans in the U. S. Varieties adapted to mechanical harvesting, coupled with improved harvesting machines, promise to lower the labor needs of castor bean production. About 1,000 of the 20,000 acres grown in 1950 were planted with U. S. 74, an improved variety adapted for stripper harvesting. Semi-dwarf type varieties specifically adapted for combine harvesting and newly developed types of harvesters are now being tested. A large collection of seed has been assembled for an intensive breeding program for further varietal improvement.

8. Sansevieria, phormium, and yucca could be used as a domestic source of cordage fiber. Big yields of high quality sansevieria fiber were produced in initial investigations in Florida. This species has been increased for possible large scale production. A world wide collection of sansevieria has been made and research is underway for improving varieties, developing agronomic practices, and determining areas of adaptation. Phormium (New Zealand hemp) has been found well adapted over a wide area along the Pacific coast, and observational plantings have been put out along the Gulf coast. About 90 per cent of the wild yucca surveyed in Southwestern States is accessible for harvesting should it become necessary to use this source of fiber. Yield and quality tests are underway.

RESEARCH ON AGRICULTURAL PROBLEMS OF ALASKA

Appropriation Act, 1951	$280,000
Budget Estimate, 1952	280,000
Change	- -

PROJECT STATEMENT

Project	1950	1951 (estimated)	1952 (estimated)
1. Research on agricultural problems of Alaska	$261,565	$280,000	$280,000
2. Building program	399,891	- -	- -
Unobligated balance	13,544	- -	- -
Total appropriation or estimate	675,000	280,000	280,000

STATUS OF PROGRAM

General: Agricultural research in Alaska is carried on as a joint program of the U. S. Department of Agriculture and the University of Alaska. The University is the Land-Grant College of the Territory and receives grant funds under the Hatch, Adams, Purnell, Bankhead-Jones and Research and Marketing Acts, as well as appropriations made by the Territory.

Under a joint director mutually agreeable to the University Board of Regents and the Research Administrator of the U. S. Department of Agriculture, investigations are conducted in soil analysis, horticulture, animal husbandry, agricultural economics, agricultural engineering, insect control, and field crop improvement. These investigations have as their object increasing farm production and stabilizing the rural economy of the Territory.

Construction Program: Under a Federal appropriation of $300,000 for fiscal year 1949 and $415,000 for fiscal year 1950, the building program is approaching completion. This program provides for the following buildings and facilities:

Palmer:

Laboratory-office building (including furniture and equipment)
Housing for staff members:
  Six two-bedroom residences
  Two four-bedroom residences
Large greenhouse
Experimental vegetable storage shed and cellar

Matanuska Branch Station:

Grain storage, threshing, and garage building

It is anticipated that all buildings now in process of construction will be completed by the end of the fiscal year 1951.

Because of increasing construction costs in Alaska, it was necessary to modify the original building program to some extent. However, within the $715,000 originally estimated, it was possible to provide 8 of the 11 proposed housing units and all of the experimental facilities with the exception of a small office and greenhouse at Fairbanks. Office space at Fairbanks has been provided by the Territory in a new building.

Examples of Recent Progress in Research

1. Alaska Soil Survey progressing. During 1949 soil classification was extended to 29,440 additional acres in the Matanuska Valley and 7,860 acres in the Tanana Valley. These surveys are of the utmost importance to settlers in showing those areas where agriculture will be profitable, and warning them against settling in sections unsuitable for crop production.

2. Smooth bromegrass has been found so clearly superior to other forage grasses that it is the only perennial grass being generally recommended for Alaska forage. It is being extensively planted for pasture, hay, and silage.

3. Fertilizing bromegrass with nitrogen has been found to raise the protein content to such an extent that farmers find it more profitable to grow protein-rich forage, particularly when used as pasture, than to purchase grain feeds.

4. Field trials of grain crops have already made possible the publication of concrete recommendations to farmers on cereal varieties, forage crop production, and the use of fertilizers.

5. Edda barley and Siberian-3 oats are to be released to Alaskan farmers for the 1951 crop season, after successful tests in Alaska this summer and multiplication of the seed through contracts with seed growers in Montana and Idaho.

6. Potato tests have shown that certain new crosses and standard varieties (Pawnee and Sequoia) gave greater yields in Alaska than the varieties commonly grown there in the past. It was also found that the table quality of the potatoes can be improved by modifying fertilizer and storage practices.

7. The outstanding performance of Northern Hybrid and Spartan hybrid tomatoes and of Highmoor and Delcrow cucumbers under glass has led several growers to select them for production in their own greenhouses during the coming year.

8. Raising cows in Alaska has been found much cheaper than shipping them in. Bull calves can be fed skim milk powder and at 6 months of age are worth more for beef than it costs to raise them. Practically all calves produced in the dairy sections of Alaska are accordingly now being raised, the heifers for milk production and the bull calves for meat.

9. In the dairy breeding program, the first cross-bred heifer calves are now available for trials of milk production.

10. Feeding experiments have shown that silage is more productive (per dollar of cost) than hay -- 3,200 pounds of milk per acre of hay, 4,000 pounds per acre of silage.

11. Extra light in dairy barns in the long Artic winter tended to result in an increased calf crop, but did not seem to affect milk production appreciably.

12. Losses of mink from diseases have been reduced by diet changes. When mink kits less than 12 weeks old are fed rations having a high salmon content, many die from "yellow fat" disease. Excluding salmon from the diet until the mink are older has stopped such losses.

OFFICE OF EXPERIMENT STATIONS

Purpose Statement

The Office of Experiment Stations as presently organized was established in 1888 following passage of the Hatch Act of 1887 authorizing Federal grants for State agricultural experiment stations.

The primary function of the Office of Experiment Stations is the administration of the Acts of Congress authorizing Federal-grant funds for research at the agricultural experiment stations of the Land Grant Colleges in the States, Hawaii, Alaska, and Puerto Rico. A major responsibility involved in this function is the coordination of research effort among the State experiment stations and between these experiment stations and the research agencies of the Department of Agriculture. The Office also has responsibility for operating the Federal Experiment Station in Puerto Rico.

Grant Fund Administration. Administration of grants to the States involves (1) advance approval of each individual research proposal financed in whole or in part from the Federal-grant funds to assure their efficient and legal use; (2) close advisory relations with the experiment stations with reference to the character, quality, and conduct of the research for which funds are expended; (3) annual examination in the field of the research and expenditures of each experiment station under the several grant acts; and (4) preparation of an annual report to Congress on this research and the expenditures, as required by law. There are currently active approximately 4,200 specific lines of agricultural investigations being financed from Federal-grant funds which are a responsibility of this Office, as well as approximately 5,100 other lines of inquiry at the State agricultural experiment stations which are supported from non-Federal funds.

Research Coordination. The Office participates actively in the planning and coordination of research among the experiment stations and between the stations and the Department of Agriculture. Members of the technical staff of the Office (1) assist the States in planning cooperative research programs to secure integration and the fullest coordination; (2) assist Federal research agencies in arranging for cooperation with the States; (3) actively participate in planning conferences and work groups engaged in development of regional research involving two or more States; and (4) suggest to the States lines of inquiry most needed to establish well-rounded regional programs.

The Office is also responsible for administering the Federal Experiment Station in Puerto Rico which serves as a tropical outpost of the Department for the conduct of agricultural research dealing principally with the development and production of crops of strategic importance which can be grown only in the tropics and with other crops which may be of economic importance especially to the Southern States.

As of November 30, 1950, the Office had 114 employees, 66 of whom were in Washington and the balance in the field.

	Estimated, 1951	Budget estimate, 1952
Appropriated funds:		
Payments to States, Hawaii, Alaska, and Puerto Rico	$12,416,208	$12,453,708
Salaries and Expenses	407,500	400,000
Total	12,823,708	12,853,708

Summary of Appropriations, 1951 and Estimates, 1952

	Total estimated available, 1951	Budget estimates, 1952	Increase (+) or Decrease (-)
Payments to States:			
Hatch Act	$720,000	$720,000	--
Adams Act	720,000	720,000	--
Purnell Act	2,880,000	2,880,000	--
Bankhead-Jones Act, secs. 3 and 5, Title I	2,863,708	2,863,708	--
Bankhead-Jones Act, secs. 9 and 11, Title I (as amended by the Act of Aug. 14, 1946)	5,000,000	5,000,000	--
Hawaii	90,000	90,000	--
Alaska	52,500	90,000	$+37,500
Puerto Rico	90,000	90,000	--
Total payments to States	12,416,208	12,453,708	+37,500
Salaries and Expenses	407,500	400,000	-7,500
Total, direct annual appropriation	12,823,708	12,853,708	+30,000

(a) Payments to States, Hawaii, Alaska, and Puerto Rico, for Agricultural Experiment Stations

Appropriation Act, 1951	$12,416,208
Budget Estimate, 1952	12,453,708
Increase (to strengthen the research program of the Alaska Agricultural Experiment Station, as authorized by the Alaska Station Act of June 20, 1936, amended by the Act of August 29, 1950)	+37,500

PROJECT STATEMENT

Project	1950	1951 (estimated)	Increase	1952 (estimated)
1. Hatch Act (March 2, 1887)	$720,000	$720,000	- -	$720,000
2. Adams Act (March 16, 1906)	720,000	720,000	- -	720,000
3. Purnell Act (February 24, 1925)	2,880,000	2,880,000	- -	2,880,000
4. Bankhead-Jones Act, secs. 3 and 5, Title I (Act of June 29, 1935)	2,863,708	2,863,708	- -	2,863,708
5. Bankhead-Jones Act, secs. 9 and 11, Title I, of the Act approved June 29, 1935, as amended by the Act of August 14, 1946 (Research and Marketing Act)	5,000,000	5,000,000	- -	5,000,000
6. Hawaii Act (May 16, 1928)	90,000	90,000	- -	90,000
7. Alaska Act (February 23, 1929)	15,000	15,000	- -	15,000
8. Alaska Act (June 20, 1936) as amended by the Act of Aug. 29, 1950 (P.L. 739)	27,500	37,500	+$37,500 (1)	75,000
9. Puerto Rico Act March 4, 1931)	90,000	90,000	- -	90,000
Total available	12,406,208	12,416,208	+37,500	12,453,708
Transfer in 1951 estimates from "Research and Marketing Act of 1946, Department of Agriculture"	-5,000,000	- -		
Total Appropriation or estimate	7,406,208	12,416,208		

INCREASE

(1) An increase of $37,500 to strengthen the research program of the Alaska Agricultural Experiment Station (authorized by the Alaska Station Act of June 20, 1936, as amended by the Act of August 29, 1950).

Need for Increase: Postwar development in Alaska has intensified the demand for information which will promote increased and more efficient production of crops in the Territory. Great distances from continental markets and resultant high prices for imported products have placed heavy pressure on the agricultural experiment station for research information which will make possible an increase in production of local agricultural crops.

Because of the strategic location of Alaska in relation to the present unsettled world conditions, it is imperative that the quantity of agricultural production in Alaska be increased to the maximum extent possible to supply both civilian and military population in the Territory. Improvement of the quality of Alaskan agricultural products, both currently and as a long term program, is also urgently needed. To carry out these major objectives, solution must be found to the many problems facing farmers in the Territory through intensification of the agricultural research program.

The problem is accentuated by the fact that the best known areas for agricultural production are widely separated in a Territory one-fifth as large as the continental United States, and with a wide range of climatic conditions. Because of these differences in climatic conditions, it is essential that new research data be developed for the different agricultural areas in Alaska since results of research conducted within the continental United States usually are not applicable.

The following are examples of research problems which require prompt solution:

(a) At present, little is known about the composition of plants grown under Alaska conditions. There is a rather widespread opinion in Alaska that the quality of locally grown crops is inferior to that of crops grown in the States. Many agricultural workers believe that this is largely a matter of "Field-run" Alaska crops competing with graded State products. Therefore, research on chemical composition of Alaska crops grown for human and animal consumption is urgently needed to determine where there is any significant nutritional difference between such Alaska grown crops and crops grown in the continental United States. This problem points to the need for chemical research of a fundamental nature to assist not only in the solution of nutritional problems but also in other similar phases of the station's research program.

(b) The branch station at Petersburg, Alaska, is the only place in the Territory where research on fur-bearing animals is being conducted. At the present time, only one technical specialist, a biologist, is stationed at Petersburg. As a result, very little research has been possible on animal diseases although serious difficulty is being encountered with such problems as "yellow fat" disease of mink. This disease causes severe losses among mink kits being fed on salmon rations. An animal pathology research program to determine the underlying factors causing this disease is necessary. Such a program should not be restricted to fur-bearing animals, but should include research on diseases of domesticated animals, especially dairy cattle.

(c) The development of livestock industries in Alaska is dependent, to a large extent, upon the production of locally grown feeds. The cost of importing roughages is prohibitive and the high cost of concentrates makes it imperative that a large portion of such feeds should be produced in Alaska. The rigorous climate of Alaska calls for special knowledge of crop production and much research is needed in breeding adapted plants, improved production practices, and better methods of processing cereal and forage crops. Agronomic research under Arctic and sub-Arctic conditions has been limited and, in many cases, fundamental studies are needed. For these purposes, it is essential that agronomic research be conducted in the Tanana area at Fairbanks and in the Matanuska Valley at Palmer.

CHANGES IN LANGUAGE

The estimates include proposed changes in language as follows (new language underscored, deleted matter enclosed in brackets):

For payments to the States, Hawaii, Alaska, and Puerto Rico to be paid quarterly in advance where applicable, to carry into effect the provisions of the following Acts relating to agricultural experiment stations:

Hatch, Adams, Purnell, Bankhead-Jones, and related Acts: * * *
Bankhead-Jones Act, title I of the Act approved June 29, 1935
(7 U. S. C. 427-427g), sections 3 and 5, $2,863,708, and sections
9 and 11 of said Act as added by the Act of August 14, 1946 (7
U. S. C. 427h, 427j), including administration by the Office of
Experiment Stations in the United States Department of Agricul-
1 ture, $5,000,000[, no part of which latter amount shall be used
for beginning construction of any building costing in excess of
$15,000, except that a poultry breeding house may be constructed
at Purdue University at a cost to this appropriation of not to
exceed $29,000]; * * * and the provisions of section 2 of the
2 Act approved June 20, 1936, <u>as amended</u> (7 U. S. C. 369a, <u>Public
Law 739, approved August 29, 1950</u>), extending the benefits of
the Adams and Purnell Acts to the Territory of Alaska, [$37,500]
<u>$75,000</u>; Puerto Rico, the Act approved March 4, 1931, as amended
(7 U. S. C. 386d-386f), extending the benefits of certain Acts
of Congress to Puerto Rico, $90,000; in all, payments to States,
Hawaii, Alaska, and Puerto Rico, [$12,416,208] <u>$12,453,708</u>.

<u>The first change</u> is proposed for the purpose of deleting language prohibiting the use of funds for beginning construction on any building costing in excess of $15,000, and the provisions included in the 1951 Appropriation Act authorizing construction of a poultry breeding house at Purdue University.

The limitation on construction was originally inserted for the purpose of providing a general limitation applicable to the agencies of the Department receiving funds under the Research and Marketing Act. However, since section 10(a) and 10(b) Research and Marketing Act funds have been merged with related appropriations of the Departmental agencies, this limitation now applies only to payments to the State agricultural experiment stations under section 9 of the act. Because of their special nature, limitations have not been previously placed on construction by the States under Federal-grant funds. Inasmuch as projects are, in general, not formulated and approved in detail a year prior to the availability of funds, it is difficult to predict in advance and make provision in the budget estimates for all contingencies that may arise relative to construction needs. On the other hand, it has been a policy of long standing that the State stations furnish the major facilities for continuing research under the Federal-grant funds. The Office of Experiment Stations approves the use of these funds for purchase of land or construction only when it has been clearly demonstrated that such facilities are essential to the proper conduct of specific research projects. The use of Federal-grant funds for construction of administration, laboratory, or general purpose building has never been permitted.

Facilities for projects under the Regional Research Fund, however, must be constructed largely through the use of section 9 funds, since the State in which the project is being conducted usually cannot, and should not be expected to, provide the full cost of such construction, and since cooperating States cannot expend their funds outside the borders of their respective States. Therefore, because of the nature of these funds and the policy governing their use, it is believed that the retention of the limitation is unnecessary and should be deleted to assure needed flexibility and permit such construction as circumstances may warrant in connection with approval of specific reojects of a regional nature.

The second change in language is to include the amendment to the Alaska Station Act of June 20, 1936, by the Act of August 29, 1950, Public Law 739.

STATUS OF PROGRAM

General: The several appropriations under "Payments to States, etc." represent the Federal Government's support and encouragement to the State, Territorial, and Puerto Rican agricultural experiment stations which were established as departments of the land-grant colleges pursuant to the provisions of the Hatch Act of 1887.

The State agricultural experiment stations conduct research and experiments along the lines authorized by the several Federal-grant fund acts and the complementary acts of the States on the many problems constantly encountered in the development of a permanent and sustaining agriculture and in the improvement of the economic and social welfare of the farm family. Because of differences in climate, soil, market outlets, and other local conditions, each State has distinct problems of production and marketing of crops and livestock. The farmers in the individual States naturally look to their State agricultural experiment stations for solution of State and local problems, and in recent years have requested increased service to help meet changing conditions.

The research programs of the State stations, to be most effective, include participation in regional and national programs. Joint attack by a group of State stations is the most effective and often the only practical approach to problems of common interest. The stations, to an ever increasing extent, are acting as regional groups to provide cooperative coordinated attacks on problems of regional and national interest. In a similar manner, the research programs of the State agricultural experiment stations and the Department of Agriculture are supplementary and interdependent.

These Federal-grant funds constitute a powerful force in bringing about inter-State cooperation and Federal-State collaboration in the planning and conduct of this over-all program of agricultural research. Therefore, the full impact of the Federal-grant funds on this program cannot be fully evaluated solely on the basis of the amount of funds thus provided.

Research at the stations during the fiscal year 1950 included approximately 4,200 specific lines of research financed wholly or in part by Federal-grant funds and about 5,100 lines of research under non-Federal funds available to the stations.

These lines of research are continued as long as they are progressively productive. Approximately 17 percent of the research program passes its point of maximum productiveness annually and is replaced by new research on pressing problems.

Distribution of Payments. The following table indicates the distribution of funds to the various stations during the fiscal year 1950 under the formulas contained in the authorizing legislation and includes Research and Marketing Act funds which were combined with "Payments to States" in the 1951 Appropriation Act:

TABLE A

Distribution by State of Federal-Grant Funds Authorized by the Hatch, Adams, and Purnell Acts, Title I of the Bankhead-Jones Act, and Section 9, Research and Marketing Act - Fiscal Year 1951

State	Hatch, Adams and Purnell Acts 1/	Title I, Bankhead-Jones Act	Sections 9(b)1 and 9(b)2 Research and Marketing Act	Total Federal-Grant Funds
Alabama	$ 90,000.00	$ 96,152.81	$ 118,337.56	$ 304,490.37
Alaska	52,500.00	2,627.86	20,920.04	76,047.90
Arizona	90,000.00	15,499.36	31,490.04	136,989.40
Arkansas	90,000.00	74,312.76	98,754.70	263,067.46
California	90,000.00	95,542.61	91,417.48	276,960.09
Colorado	90,000.00	26,055.98	41,742.64	157,798.62
Connecticut	90,000.00	26,258.56	36,090.76	152,349.32
Delaware	90,000.00	6,054.94	24,301.46	120,356.40
Florida	90,000.00	40,579.22	50,946.22	181,525.44
Georgia	90,000.00	101,476.80	120,955.28	312,432.08
Hawaii	90,000.00	10,269.39	28,450.40	128,719.79
Idaho	90,000.00	16,589.81	35,604.96	142,194.77
Illinois	90,000.00	100,946.87	105,872.66	296,819.53
Indiana	90,000.00	73,383.88	87,106.72	250,490.60
Iowa	90,000.00	74,752.37	89,887.30	254,639.67
Kansas	90,000.00	57,178.54	67,623.70	214,802.24
Kentucky	90,000.00	95,122.25	115,404.96	300,527.21
Louisiana	90,000.00	65,919.96	85,178.44	241,098.40
Maine	90,000.00	24,124.05	37,979.00	152,103.05
Maryland	90,000.00	35,303.01	46,055.54	171,358.55
Massachusetts	90,000.00	21,787.39	35,751.10	147,538.49
Michigan	90,000.00	85,827.73	95,112.60	270,940.33
Minnesota	90,000.00	66,813.91	88,077.22	244,891.13
Mississippi	90,000.00	84,569.98	115,794.68	290,364.66
Missouri	90,000.00	89,383.63	106,039.24	285,422.87
Montana	90,000.00	17,871.46	34,513.38	142,384.84
Nebraska	90,000.00	44,233.72	57,743.04	191,976.76
Nevada	90,000.00	3,190.40	21,738.58	114,928.98
New Hampshire	90,000.00	9,925.30	27,101.98	127,027.28
New Jersey	90,000.00	36,470.37	42,398.00	168,868.37
New Mexico	90,000.00	16,935.36	34,773.18	141,708.54
New York	90,000.00	110,224.63	100,691.92	300,916.55
North Carolina	90,000.00	123,766.51	145,018.08	358,784.59
North Dakota	90,000.00	28,147.42	44,318.38	162,465.80
Ohio	90,000.00	109,337.26	114,946.50	314,283.76
Oklahoma	90,000.00	78,367.16	89,931.48	258,298.64
Oregon	90,000.00	26,588.72	42,547.16	159,135.88
Pennsylvania	90,000.00	157,876.48	130,364.04	378,240.52
Puerto Rico	90,000.00	62,082.14	92,283.74	244,365.88
Rhode Island	90,000.00	2,857.19	21,643.08	114,500.27
South Carolina	90,000.00	69,224.19	88,855.84	248,080.03
South Dakota	90,000.00	27,733.01	42,917.76	160,650.77
Tennessee	90,000.00	89,992.09	113,618.52	293,610.61
Texas	90,000.00	173,212.81	185,536.50	448,749.31
Utah	90,000.00	12,170.15	29,309.12	131,479.27
Vermont	90,000.00	12,078.01	29,190.60	131,268.61
Virginia	90,000.00	82,941.86	98,338.98	271,280.84
Washington	90,000.00	38,797.09	51,558.50	180,355.59
West Virginia	90,000.00	65,169.05	71,672.80	226,841.85
Wisconsin	90,000.00	70,152.59	88,024.64	248,177.23
Wyoming	90,000.00	7,829.36	26,069.34	123,898.70
Total	$4,552,500.00	$2,863,708.00	$3,599,999.84	$11,016,207.84
/Regional Research Fund			1,250,000.00	1,250,000.00
Grand Total	$4,552,500.00	$2,863,708.00	$4,849,999.84	$12,266,207.84

/ Alaska received $15,000 Hatch, $7,500 Adams, and $30,000 Purnell funds; all other stations $15,000 Hatch, $15,000 Adams, and $60,000 Purnell funds.

/ These funds allotted to Regional Research projects recommended by the Committee of Nine, in accordance with procedures outlined in Section 9(b)3 of the Research and Marketing Act.

Table B - Statement of direct payments to States, Hawaii, Alaska, and Puerto Rico, indicating those requiring offset and those not requiring offset, and basis of distributions, as estimated for 1952

Item	Total Estimate, 1952	Amount to be paid without offset	Amount Requiring Offset and Basis of Allotment	
			Amount	Basis of Allotment
Hatch Act.....	$ 720,000 a/	$ 720,000	None	Equal amounts to each State.
Adams Act.....	720,000 a/	720,000	None	Equal amounts to each State.
Purnell Act.....	2,880,000 b/	2,880,000	None	Equal amounts to each State.
Bankhead-Jones Act, secs. 3 and 5, Title I.....	2,863,708	--	$2,863,708	Principally on the basis of rural population in the States, Territories and Puerto Rico
Bankhead-Jones Act, secs. 9 and 11, Title I (as amended by the Act of Aug. 14, 1946).....	4,850,000	$1,250,000	3,600,000	20% in equal amounts to each State, Territory and Puerto Rico; not less than 52% by formula: 1/2 on basis of relative rural population, 1/2 on basis of relative farm population, 25% as regional research funds.
Hawaii Station Act.....	90,000	90,000	None	
Alaska Station Act of Feb. 23, 1929.....	15,000	15,000	None	
Alaska Station Act of June 20, 1936, as amended by the Act of Aug. 29, 1950...	75,000	75,000	None	
Puerto Rico Station Act....	90,000	90,000	None	
Total, direct Federal payments	12,303,708	5,840,000	6,463,708	

a/ $15,000 to each State.
b/ $60,000 to each State.

Examples of Research Findings That Reached the Stage of Public Application During the Year.

1. The Hawaii station has developed a sugarcane crop-log which is now in practical and successful use on over 50,000 acres. It is a record-guide of the crop's progress from planting to harvest, based on physical and chemical measurements and observations made on growing plants in the field. Such sensitive factors as light, average daily radiant energy, sheath moisture, percent green weight, and daily maximum and minimum temperatures are measured. The crop-log makes possible technical control of cane-growing similar to technical control used by industry in the manufacture of highest quality products. Records kept by plantations before and after use of the crop-log showed that it increased yield by one ton of sugar per acre per year. With sugar valued at $100 a ton, use of the crop-log would increase the gross income of a 12,000 acre plantation by $1,200,000.

2. Corn cobs can be used as the only roughage in wintering beef cattle, the Indiana Experiment Station has shown. Steer calves were wintered successfully for 168 days using corn cobs as the only source of roughage. The remainder of the ration included small amounts of soybean meal, molasses, minerals, and vitamin A supplement. In general, the lots of steers wintered on corn cobs remained healthy, had glossy hair coats, showed no outward signs of malnutrition, and gained about 1/4 lb. per day more than comparable steers having free access to clover timothy hay. Indiana produces approximately a million and a half tons of corn cobs annually, enough to winter approximately one million head of cattle. With an assumed nutritive value of approximately $10 per ton, the potential value for cobs produced in Indiana, if fed to cattle, would be $15,000,000 annually.

3. Intensive studies of conditions relative to the establishment of organized produce markets in the cities of Monroe and LaFayette, Louisiana, were completed during the year by the Louisiana station and reports prepared for use of civic and agricultural groups. A study of Louisiana produce markets throughout the State showed that factors underlying success or failure include: (1) economic need for farmer markets; (2) volume of produce available; (3) local demand; (4) cooperation and support of interested groups; (5) financial arrangements; (6) location of the market site; (7) market facilities and plan; and (8) nature of ownership control and management. Direct results of the study include new State legislation authorizing market corporations and active consideration of new markets in several cities.

4. The value of surveying both surface and subsurface layers of soil before irrigation areas are definitely laid out was demonstrated in a soil survey made by the North Dakota Experiment Station in the Missouri-Souris area. On the basis of the survey, carried on in cooperation with the Reclamation Service, 100,000 acres of land were eliminated from consideration for irrigation purposes. The area was shown to have a non-permeable subsurface layer which would have prevented absorption of irrigation waters and in a short time would have brought about chemical changes in the soil that would have made it unsuitable for irrigation crops.

5. When nematodes are present in soil on which cotton is grown, they injure roots and open passage ways for the Fusarium wilt fungus to enter the cotton plant. The Mississippi station greatly reduced damage from wilt by killing the nematodes. Nematode infested soils were fumigated with 20 gallons of ethylene dibromide per acre. Yields of cotton on the fumigated plots averaged 2,000 pounds per acre compared with yields of 210 pounds per acre on the untreated check plots. Estimated costs of the treatment are about $50 an acre for the over-all application of 20 gallons and less than $30 an acre where only the rows were treated with the fumigant.

6. Marketing studies carried on by experiment stations in the retailing of peaches continue to show that consumers are strongly influenced by the quality and appearance of the fruit in the store. The Michigan station gained evidence that the following factors influenced consumer choice in the order given: ripeness or maturity; freedom from rot and waste; flavor; bruises; and split pits. One Michigan chain grocery has calculated that it can save $15,000 annually by following the recommendations coming out of this research. The Texas station found that growers selling only firm, ripe peaches received prices twice as high as the State average, which far more than offset the extra care required in handling and packaging ripe peaches.

7. The Oklahoma station reports remarkable increases in beef cattle gains due to pasture fertilization. These increases ranged from 16 to 72 percent for various treatments on three different soil types. The cost of the fertilizer, which is applied every third year, has been about 2-1/2 cents for each additional pound of beef produced.

8. The Alabama Experiment Station has developed in its research several new products made from sweetpotatoes. Among these are Alayam candy, Alayam snacks, and Alayam breakfast foods. In a nation-wide survey completed in 1950 by the Alabama station and the Department, consumer

reactions to these new products were shown to be highly favorable. This research promises new market outlets for this important southern food crop.

9. Florida is the leading eggplant producer among five States where this crop is commercially grown. In 1948, the combined value of Florida's winter, spring, and fall crop of eggplant was over $1,600,000. Recently, however, the fungus Phomopsis, which causes tip-over, leaf-blight, and fruit-rot, made many of the commercial acreages useless for profitable eggplant production. In the past year the Florida Experiment Station announced that its plant breeders had developed two Phomopsis-resistant varieties of eggplant. One is Florida Market, a winter and spring yielder maturing in 83 days. The other is Florida Beauty, adapted for fall and early spring production, maturing in 80 days. One ten acre commercial field of Florida Market produced a satisfactory crop in central Florida in 1949 while neighboring fields of non-resistant varieties suffered from 50 to 100 percent losses due to Phomopsis blight.

10. After ten years of fundamental research by the Minnesota Experiment Station, its dairy department has developed a model milk drier that overcomes previous objections as to flavor in the manufacture of dried whole milk powder. In addition, the new drier permits the packing of from 25 to 50 pounds more powder per barrel. This unit, working at full capacity throughout the year, can save a plant up to $16,000 a year on containers alone when compared with some conventional driers.

11. Sweet corn marketing improvements reduced shrink and increased net returns to producers as a result of icing and other improvements growing out of Illinois Experiment Station research on the market handling of sweet corn. The shrink was reduced by 33 percent. After deducting the additional cost incurred due to icing, the growers who delivered to chainstore A netted an additional 6.4 cents and those who delivered to chainstore B, 5.1 cents above market prices in St. Louis.

12. Western livestock men are becoming increasingly alarmed about Halogeton glomeratus, a poisonous plant found on the western ranges and eaten readily by cattle and sheep. The Nevada Experiment Station has shown that there is little or no hope of salvaging sheep by calcium replacement treatments now in common use after the animal has eaten toxic amounts of the plant. There is a relationship between weight of animal and the amount of plant eaten; 150 grams of the plant will kill a 73 pound lamb; and 250 - 300 grams will kill mature ewes weighing 121 - 150 pounds. The Nevada

research shows that there are certain stages of growth when Halogeton is exceptionally dangerous. In the late summer and fall the only known safeguard is to keep sheep off the infested range until the oxalates are leached out by fall and winter rains and snows.

13. Overheated soybean meal has been a problem in poultry feeds. Research has shown that some heat is necessary to destroy a chick growth-inhibiting factor present in the raw meal, but too much heat either destroys essential amino acids or makes them unavailable for chicks. The Washington Experiment Station has developed a fluorimetric method that can be used by processors to prevent the incorporation into poultry feed of meal that has been damaged by heat. Processors and feed mixers are rapidly adopting this new method.

14. The Kansas Experiment Station found that the use of proper insecticides, under favorable conditions, raises alfalfa seed production from the State average of 75 pounds per acre to 300 and more pounds per acre. Many farmers in western Kansas are now adopting the practice with excellent results both in terms of income and in building up the crop of alfalfa seed which is currently in short supply.

15. Motionless refrigerated air is less efficient in cooling vegetables than cold air in motion, according to a report by the New York [Cornell] Experiment Station. Under rigidly controlled conditions, the station found that cold air moving at the rate of 600 to 750 feet per minute would cool vegetables up to 18 times as fast as still air. Broccoli in separate one-pound bunches cooled from 70 degrees Fahrenheit to 37 degrees in 15 minutes where air was moving. It took 4 hours to get the same temperature drop in still air. Losses of moisture during such rapid cooling were too small to be important either when the relative humidity was maintained at 90 percent or reduced to 70 percent. This work points the way to providing more efficient cooling for perishable products both in storage and transit.

Regional Research Fund

The "Regional Research Fund" authorized by Section 9(b)3 of the Research and Marketing Act is available for research in which two or more State agricultural experiment stations are cooperating to solve problems that concern the agriculture of more than one State. This fund consists of not more than 25 percent of the amount appropriated under Section 9 of the Act. Allotments are made to stations on the basis of projects recommended by the Committee of Nine established by the Act to represent the State stations.

The following table indicates the distribution of the Regional Research Fund by subject matter:

Table C -- Distribution of Regional Research Fund by Subject Matter

	1950	1951 (Est.)
Marketing Research		
Cotton	$ 30,000	$ 29,000
Fruits and Vegetables	79,500	75,100
Livestock and Wool	66,250	66,088
Milk and Dairy Products	54,700	60,829
Potatoes	63,400	48,900
Poultry and Eggs	87,500	91,262
Other	--	5,264
Total Marketing Research	381,350	376,443
Non-Marketing Research		
Beef Cattle Breeding	123,000	120,461
Cotton Improvement and Mechanization	122,000	116,185
Dairy Cattle Breeding and Sterility	92,000	91,242
Diseases and Parasites-Animals & Poultry	44,900	44,775
Farm Buildings	43,500	42,900
Farm Housing	112,700	111,450
Foods and Human Nutrition	171,200	168,856
Introduction of New Plants	56,500	76,000
Pasture and Forage Crop Improvement	24,945	24,368
Poultry Breeding	38,500	38,815
Soil Management	21,500	21,344
Other	11,905	11,161
Total Non-Marketing Research	862,650	867,557
Travel by Committee of Nine	6,000	6,000
Total, Regional Research Fund	1,250,000	1,250,000

In addition to the Regional Research Fund, substantial amounts of other Federal-grant funds and funds of non-Federal origin are being expended in furtherance of regional research projects. It is estimated that a total of $5,920,000 will be expended by the State agricultural experiment stations in 1951 to carry out the regional research projects activated to date, of which only $1,250,000, or 21 percent, will be available from the Regional Research Fund.

Initiation and Completion of Regional Research Projects. Within the three years since the allotments under Section 9 have been available, 78 cooperative regional projects have been initiated as shown below:

Table D - Regional Research Projects

Calendar Year	Projects Started	Projects Completed	Total Active Projects
1948	52	--	52
1949	3	--	55
1950	18	3	70
1951	5	5	70
Total	78	8	70

In addition to the 8 projects that have been completed, specific phases of other projects have been completed and the objectives and procedures of a number of regional projects have been revised. The new projects undertaken in 1951 include 2 marketing projects and three projects in other fields.

Publication of Research Results. The research program financed by Section 9 funds is producing new information of benefit to producers, distributors, and consumers as shown in a recent compilation of State station publications. While not complete, the list indicates a total of 816 publications resulting from research projects supported wholly or in part from Section 9 funds. It is estimated that more than half of the publications shown in the following tabulation are reporting results of research under Regional Research projects:

Table E - Publications Reporting Results of Research Financed by the Research and Marketing Act

Calendar Year	Bulletins and Circulars		Scientific Journal Articles	Popular Articles	Total
	Printed	Processed			
1950 *	58	17	86	20	181
1949	87	70	181	42	380
1948	54	37	102	18	211
1947	9	14	18	3	44
Total	208	138	387	83	816

* January to June, 1950.

Examples of Research Results From Regional Research Projects

Cotton Production Costs Lowered Through Mechanization. To reduce cotton production costs, the State agricultural experiment stations in twelve cotton producing States, in cooperation with the Department of Agriculture, developed a Regional Research project which is producing results exemplified in the following cases:

Agricultural engineers of the Oklahoma station have designed and built a harvester incorporating a new stripping principle. The plants pass between two revolving brush rolls which sweep the cotton off the plant. The advantages of this harvester over present commercial types include simplicity of design, ease of manufacture, and the fact that it can be mounted directly on standard farm tractors. In addition, stalks are not uprooted, very little trash is gathered, and machine losses are very low.

A machine built by the Mississippi station applies both spray and dust materials for insect control. When used for spraying, it gives coverage and control with rates as low as 1/2 gallon per acre which compares favorably with airplane application. This station has also developed a spray machine which can be attached directly to a tractor-cultivator thus allowing the spraying of insecticides during cultivation. It will allow effective control of both thrips and boll weevil during normal cultivation, with no labor charge for application except that required to fill the insecticide tank.

A machine developed by the North Carolina station makes possible measurement of the efficiency of differential placement of fertilizer by placing fertilizer in the drill or in bands 3, 9, or 15 inches from the drill at varying depths. By using radioactive fertilizer with this machine, it has been found that cotton roots feed from fertilizer placed 3 inches from the row in about two weeks but do not use fertilizer from the 15 inch bands until 75 days after planting. Great savings should result from this research through more efficient use of fertilizer.

The Texas station found that the use of rotary hoes for cultivating cotton reduced hoeing labor by 61 percent, amounting to a saving of $6.50 per acre. In the High Plains region the reduction in hoeing costs amounted to 16.8 percent where the rotary hoes were used in conjunction with the lister-cultivator.

Heavy Egg Marketing Losses Can be Prevented. An intensive study on improved techniques for marketing eggs has enlisted the united efforts of 13 North Central States and the Department of Agriculture. In general, the project shows that the existing system of marketing is complex and in some cases cumbersome but that the net margin over costs of handling eggs is small.

A survey by the North Dakota Experiment Station showed that 82 percent of the producers in that State had less than 100 laying hens. The survey showed that 37 percent of producers produced eggs that were 60 to 69 percent "A" quality; 25 percent produced 70 to 79 percent "A"; 19 percent, 80 to 89 percent "A"; and 19 percent, 40 to 49 percent "A". If one-third of the eggs in the State now selling below grade "A" were raised to grade "A" standards as a result of this study, causing an increased return of only three cents per dozen more, the producers would receive about $400,000 more annually.

A similar survey by the Missouri station revealed that the quality of 56 million dozen eggs in 1949 in that State could have been a higher grade as a result of better management.

The Michigan station found that there was a quality loss between the buying station and the central plant amounting to $28.30 per 100 cases of eggs handled.

Investigations by the Kentucky station showed that from 5 to 12 percent of the eggs sold by farmers never reached the consumer --a loss reflected in lower farm price. Discounts in price due to poor condition and preventable losses on the farm and in marketing channels cost Kentucky producers approximately five million dollars annually. Such facts are being brought to the attention of producers in marketing clinics, educational meetings, etc. to solve the problem.

Improved Beef Cattle Through Breeding. Because of tremendous differences in climate in various areas of the country and the considerable genetic variability within present strains of beef cattle for such characters as rate of gain, economy of feed utilization, and carcass quality, the State agricultural experiment stations in the Southern, North Central, and Western regions, cooperating with the Department's Bureau of Animal Industry and numerous private breeders, have undertaken a Nation-wide program of research to develop superior strains of beef cattle adapted to the various areas. Although this project is by nature a long term project some significant results have already been obtained.

In the Western region, it has been found that the progeny of different sires within breeds are beginning to show variations as wide as 0.4 lb. daily gain accompained by an economy of gain of as much as 1/3 less in the amount of feed per unit of gain. The Montana station reports that net returns per steer from superior performing bulls have been increased by more than $30 per head over individuals from other sire groups. Applying this to only 1/4 of the State's beef cattle industry would amount to $2,000,000 additional annual revenue.

In the North Central region identical and fraternal twin heifers are being used to study genetics and associated environmental and physiological relations. By using such twins accurate measurements of variation in animals under various controlled conditions can be obtained. The intensive search for superior breeding stock has led to the establishment of 14 new breeding lines totaling over 150 animals and has brought about real advances in the methodology of breeding.

In the Southern region where the project has been active for only one year the primary concern has been the development of new breeds of beef cattle that will be adaptable to Gulf Coast conditions. There are now 39 lines of cattle in the project which include Angus and Hereford pure-breeds as well as cross lines with native stock, Africanders, Zebu, and Romosinuanos (a tropical breed) obtained by means of semen imported from Colombia. From these various lines, it is anticipated that superior beef cattle for the Southern States can be developed through further breeding and selection.

Better Materials for Farm Buildings. Twelve North Central agricultural experiment stations and the Department of Agriculture are engaged in a cooperative regional study of farm building materials to determine best methods of use to effect savings to farmers or economies through greater durability. Although the studies have been under way for only three years, some early results indicating progress are encouraging.

The Illinois station reports that aluminum and aluminum products used in the construction of a poultry house have given satisfactory performance. No corrosion is evident even from contact with wet litter and droppings. Atmospheric conditions are comparable to those in conventional houses. The Iowa and Illinois stations show that aluminum roofs reduce air temperatures in farm buildings.

The Michigan station finds that building blocks made of ground corn cobs and cement work quite well and are easy to handle. Their insulating value is about the same as cinder concrete blocks.

The South Dakota station has devised low-cost, hard-surfaced floors for farm buildings which incorporate labor-saving materials and methods. Information to the farmer has been made available through the recent printing of a station bulletin.

The Indiana station reports encouraging results in their research study to develop a building panel of agricultural waste plant material. The possibility of bonding cornstalks into building boards looks feasible, and experimental panels are undergoing

further tests for suitability and durability for the rigid requirements of floors, ceilings, walls, and roofs. So far, it appears that little framing will be required when the panel is used in construction, but most important is its low heat conductivity.

Expanding the Market for Dairy Products. Because of the great importance of dairy products in the agricultural economy of many States, the State agricultural experiment stations in both the Northeast and North Central regions have established regional projects concerned with the marketing of dairy products. Although these projects have been operating only a relatively short time, important findings are being made. The following are examples:

During the past few years there has been a rapid increase in the use of milk-solids-not-fat (constituting about 10% of whole milk) in bakery products. To a considerable extent this has been due to baking and cooking tests such as those conducted at the Wisconsin station which showed that more nutritious baked products with greater volume and better texture resulted from use of from 3 to 6 percent milk-solids-not-fat.

As a result of similar tests in New York State, the use of dry skim milk in bread alone is said to have increased more than a million pounds annually in that State.

The Illinois and Missouri stations cooperated on studies of costs of processing and distributing milk in the St. Louis area. Findings from these studies were used in the development of a more equitable formula for paying producers and brought about modification of Federal Milk Orders for the area.

An "ideal" production-consumption balance of milk supplies between primary and secondary markets has been worked out through research conducted by the Northeast agricultural experiment stations. The plan involves redistribution of surplus milk at marketing points and should result in substantial savings in transportation costs and more efficient use of surplus milk, with consequent benefits to farmers and lower costs to consumers in this region.

The Michigan station has developed a new process for concentrating fresh milk. While the product is not comparable to fresh milk, it is superior to any previous product of this type. In addition to making a better product, this development will effect large savings in transportation costs of moving milk from producing areas to consuming areas.

Nutritional Status and Dietary Needs of Population Groups in Selected Areas of the West. This regional study, relating nutritional status to diet and environmental conditions, will aid in defining human nutritional requirements. The work, conducted in

cooperation with the Bureau of Human Nutrition and Home Economics, has entailed a field-type study in which a mobile unit was employed to obtain dietary, physical, and blood data on the selected subjects. To date intensive study has been conducted on 766 native-born "teen" age school children in Oregon; about 700 people, 50 years of age or older, in California; about 250 adults and children residing in two areas of Colorado - one at 10,000 feet and one at 6,000 feet elevation; on 2,000 families of Spanish-American origin and with characteristic dietary habits in New Mexico; and on Papaga Indian children in one area of Arizona. The mobile unit will move on for investigations of selected groups in the remaining cooperating States.

The data from the first survey to be completed have been rather exhaustively studied and have shown that between the two geographical areas studied in Oregon, there were significant differences in the incidence of dental decay among the children. These differences did not seem to be related to the dietary habits of the children, the fluoride concentration or hardness of the communal water supply, or the availability of dental services in the two areas. Additional research is needed to determine the causes of the differences. It was observed, however, that in the coast region where the caries attack ran highest, there were fewer hours of sunlight and lower altitudes than in the central Oregon region. Evaluation of the food intake records indicated that of the important nutrients, iron and ascorbic acid were adequate in the diets of the majority of these Oregon children but that less than 10 percent of them had diets adequate in protein, vitamin A, thiamine, riboflavin, and niacin as judged by current dietary standards.

Improved Marketing of Poultry. Ten Northeastern experiment stations and the Department of Agriculture are engaged in a regional study on the processes and costs of marketing poultry, and the improvement of quality of the product.

Broilers to be eviscerated and quick frozen may be successfully dressed in water of 140 degrees F., according to work at the Maryland station, without damage to appearance, flavor, or quality. This higher than conventional dressing-temperature permits a more complete removal of feathers by mechanical means at a reduced cost of 1/4 to 1/2 cent per pound of bird, while yielding a lighter, better appearing, and more easily marketed carcass.

According to Pennsylvania station studies, the wrapping of eviscerated carcasses in .0015 gauge aluminum foil before quick freezing will maintain high quality of flesh without shrinkage or freezer burn for as long as 32 weeks regardless of processing treatment or storage conditions.

The Connecticut [Storrs] station found that a concentration of poultry sales in fewer stores with large volume would reduce retailing costs as much as one-third. Through possible improvements in poultry merchandizing methods, the average shrinkage now experienced by some dealers can be reduced as much as fifty percent, or one-half cent a pound, which means a $10,000 saving annually for a large dealer.

Farm Housing in the Northeast. To provide information and plans as a guide for current farm house building and remodeling, a regional housing study in the Northeast has been undertaken. It includes first, a survey to determine what farm families have, need, and want, in farm homes; second, laboratory studies, on the basis of this information, to develop space requirements for household activities; and third; translation of the findings into house plans. The first phase has been completed and a comprehensive published report of the survey has been issued. It offers an analysis of the farm housing data collected in the 12 Northeastern States through the cooperative efforts of eight State agricultural experiment stations and the Bureau of Human Nutrition and Home Economics of the Department of Agriculture.

Similar research is under way in the other three regions.

Salaries and Expenses
Office of Experiment Stations

The Budget Estimates propose the consolidation of two current mainhead appropriation items into a single appropriation item to be known as "Salaries and Expenses, Experiment Stations, Agricultural Research Administration". This proposal would simplify the appropriation structure and the administrative functions of the Office and would in no way affect the nature or scope of the work being conducted. The following table compares the existing appropriation and project structure for these items with that proposed in the 1952 Budget Estimates:

PROPOSED CONSOLIDATION OF APPROPRIATION ITEMS
OR REVISION OF ACTIVITY SCHEDULES
(Based on amounts appropriated for 1951)

Present Structure		Proposed Structure		
		Appropriation Item	Financial Project	
Appropriation Items or Financial Projects		Salaries and Expenses	Administration of Grants and Coordination of Research with States	Federal Experiment Station, Puerto Rico
SALARIES AND EXPENSES, EXPERIMENT STATIONS, AGRICULTURAL RESEARCH ADMINISTRATION	$237,500	$412,500	$237,500	
FEDERAL EXPERIMENT STATION, PUERTO RICO	175,000	- -		$175,000
(1) Cultural, genetic, and physiological investigations of tropical and sub-tropical crops	81,750	- -	- -	- -
(2) Plant introduction and propagation including pest and disease control	68,300	- -	- -	- -
(3) Repair and construction	24,950	- -	- -	- -
Total appropriation	412,500	412,500	237,500	175,000

(b) Salaries and Expenses, Experiment Stations, Agricultural Research Administration

Appropriation Act, 1951 (Adjusted - see proposed structure, page 105)	$412,500
Reduction pursuant to Section 1214	-5,000
Base for 1952	407,500
Budget Estimate, 1952	400,000
Decrease	-7,500

SUMMARY OF INCREASES AND DECREASES, 1952

To provide a recurring amount for essential repairs and maintenance at the Federal Experiment Station, Puerto Rico	+$17,680
To eliminate a non-recurring item provided in the 1951 Appropriation Act for work on the water supply system at the Federal Experiment Station, Puerto Rico	-24,950
Decrease due to providing a direct appropriation to the General Services Administration for certain procurement costs previously paid from this appropriation	-230

PROJECT STATEMENT

Project	1950	1951 (estimated)	Increase or decrease: GSA Adjustment	Increase or decrease: Other	1952 (estimated)
Salaries and Expenses, Experiment Stations, Agricultural Research Administration:					
a. Administration of grants and coordination of research with States	$250,440	$235,000	- -	- -	$235,000
b. Federal Experiment Station, Puerto Rico	171,802	172,500	$ -230	-$7,270 (1)	165,000
(1) Cultural, genetic, and physiological investigations of tropical and subtropical crops	(96,902)	(80,250)	- -	- -	(80,250)
(2) Plant introduction and propagation including pest and disease control	(62,402)	(67,300)	- -	- -	(67,300)
(3) Repair and construction	(12,498)	(24,950)	(-230)	(-7,270)	(17,450)
Unobligated balance	10,954	- -	- -	- -	- -
Total available..	433,196	407,500	-230	-7,270	400,000

(Continued on next page)

Project	1950	(estimated)
Transfers in 1951 estimates from "Research and Marketing Act of 1946, Department of Agriculture"...	-24,200	- -
"Special Research Fund, Department of Agriculture"	-24,946	- -
Reduction pursuant to sec. 1214	- -	+5,000
Total appropriation or estimate	384,050	412,500

INCREASES AND DECREASES

(1) A net decrease of $7,270 under the project "Federal Experiment Station Puerto Rico" as follows:

(a) <u>An increase of $17,680 to provide a recurring amount for essential repairs and maintenance at the Federal Experiment Station in Puerto Rico.</u>

<u>Need for Increase:</u> The Federal Experiment Station in Puerto Rico operates an extensive physical plant consisting of over 400 acres of land, office and laboratory buildings, residences for continental staff members, garages, warehouses, and various farm buildings. Since the station was established in 1902, many of the structures have reached an age where continual maintenance is necessary. The station must also maintain roads, fences, water and sewer systems, and the electric distribution system. Being in the Tropics, in an area of heavy rainfall and high temperatures, damage from water and insects is a more serious problem than is usually encountered in the continental United States.

Because of these factors, it has been necessary on numerous occasions to request nonrecurring increases in appropriations for maintenance purposes. For example, funds were made available in 1949 to repair some of the roofs at the station; in 1950, three old frame buildings were replaced by a reinforced concrete building for warehouse and storage purposes; the appropriation act for 1951 contains authority to replace the water supply line.

A number of similar maintenance and repair items yet remain to be undertaken. The most pressing need at the present time is fencing of station property. During the past ten years the City of Mayaguez has doubled in population and size so that city property now abuts property of the station. Because of the proximity of large numbers of people, minor robberies have been frequent, with theft and damage to experimental work causing much concern. This difficulty is increased by the fact that a main road bisects station property. In order to protect Federal property and experimental work, a substantial chain link wire fence should be erected around portions of the station property.

Other items of a similar nature which must be undertaken within the next few years are the complete renovation of three concrete and frame dwellings, renovation and resetting of glass in five greenhouses, replacement of wood floors in the administration building, construction of a road to new dwellings, replacement of roof over the main administration building, and replacement of the electrical wiring in the administration building. Because these items will require expenditure over a period of years, a recurring increase of $17,680 is proposed to enable the station to maintain its physical plant. Such an increase would eliminate the necessity for provision of successive non-recurring annual increases for maintenance items.

(b) <u>A decrease of $24,950 to eliminate a nonrecurring item provided in the 1951 Appropriation Act for replacement of the existing water supply line and enlargement of the water storage reservoir at the Federal Experiment station in Puerto Rico</u>.

CHANGES IN LANGUAGE

The estimates include proposed changes in language as follows (new language underscored, deleted matter enclosed in brackets):

For necessary expenses in connection with administration of
1 grants and coordination of research with States [, to carry
out the provisions of] pursuant to the Acts approved March 2,
1887, March 16, 1906, February 24, 1925, May 16, 1928, February 23, 1929, March 4, 1931, and June 20, 1936, and Acts amendatory thereto (7 U. S. C. 361-363, 365-383, 386-386f), and title I of the Act approved June 29, 1935, as amended by
2 the Act of September 21, 1944 (7 U. S. C. 427-427g), [relative
3 to their administration] and for the administration, operation, and maintenance of an agricultural experiment station in Puerto Rico, [$237,500] $400,000; and the Secretary shall prescribe the form of the annual financial statement required under the above Acts, ascertain whether the expenditures are in accordance with their provisions, coordinate the research work of the State agricultural colleges and experiment stations in the lines authorized in said Acts with research of the Department in similar lines, and make report thereon to Congress.

[Federal Experiment Station, Puerto Rico]

[For expenses necessary to establish and maintain an agricultural experiment station in Puerto Rico, including the preparation, illustration, and distribution of reports and bulletins, and not to exceed $24,950 to replace water supply line and increase capacity of reservoir, $175,000.]

The first and second changes eliminate superfluous language, and are for the sole purpose of simplifying and shortening the wording of the item.

The third change is proposed to provide under this item the necessary authority for the operation and maintenance of the Federal Experiment Station in Puerto Rico in accordance with the proposed consolidation in the estimates of the present appropriation for the Puerto Rico station with the appropriation "Salaries and Expenses, Experiment Stations, Agricultural Research Administration". This consolidation is proposed for the sole purpose of simplifying the appropriation structure and administration of the Office and will in no way affect the nature or scope of the work being conducted.

STATUS OF PROGRAM

General: The Office of Experiment Stations (a) administers the Federal grant acts involving support of the State, Territorial, and Puerto Rico agricultural experiment stations, and (b) operates the Federal Experiment Station in Puerto Rico.

Administration and Coordination of Research: Except for the Regional Research Fund, the payments to States are made directly to each station at the beginning of each quarter of the fiscal year according to formulas prescribed by the authorizing acts. The director of each station has the responsibility of determining the program of research to be undertaken through use of these funds. In this way prompt and close range attention to the most urgent local agricultural problems is assured since the determination of program needs is made in the States. However, to assure proper coordination and to prevent duplication of effort, each individual line of research conducted wholly or in part through use of these payments to States must be approved by the Office of Experiment Stations in advance of any expenditure of funds. The principal steps involved in the administration of these grants by the Office of Experiment Stations are:

1. Examination and approval of individual lines of research submitted by the agricultural experiment stations for support under the several funds. This examination is made to ascertain that the proposed research is in conformity with the terms of the enabling legislation and that it is adequately financed, properly staffed, and effectively coordinated with similar research at other experiment stations and in the Department of Agriculture.

2. Approval of an annual program of work submitted by each station at the beginning of each fiscal year, with a tentative allocation of funds to each line of research included in the program. Subject to approval by the Office of Experiment Stations, necessary modifications both as to subject matter and allotment of funds to projects may be made within the fiscal year.

3. Annual examination at each experiment station by members of the technical staff of the Office of Experiment Stations to determine whether the station is complying with the terms and provisions of the several acts. This involves a review of progress on each individual line of research and an examination of the accounts to ascertain that the moneys are used for appropriate purposes. On the basis of such annual examination, the Office certifies each experiment station as to its continuing eligibility to receive funds appropriated for payments to States.

4. Requiring of each experiment station after the close of the fiscal year a sworn financial statement indicating the use of the funds during the year.

5. Preparation of an annual report to Congress covering the work and expenditures of the agricultural experiment stations.

In addition to the specific steps enumerated above regarding administration of these funds, the Office of Experiment Stations through its staff of research specialists carries on numerous activities pertaining to most effective use of these Federal grants for research. These include the maintenance of extensive project records, not only regarding the research financed by these Federal grants but also the extensive and closely related programs of research in the experiment stations, supported by non-Federal funds; the analysis and dissemination of information on current research activities; review of accomplishments in selected lines of work; participation in research planning conferences, particularly with reference to the organization and planning of regional research projects. These specialists also function extensively in a liaison capacity between State agricultural experiment stations and research agencies of the Department with reference to the development of cooperative research between State and Federal agencies

The research investigations of the Federal Experiment Station in Puerto Rico fall into two broad categories (1) those dealing with crops of strategic importance to the United States and (2) research on crops of value to the southern United States, conducted largely in cooperation with the other research agencies of the Department.

The Government of Puerto Rico has continued to supplement the research of the Federal station by a small annual appropriation for cooperative research on local agricultural problems. This program has been concerned particularly with such crops as vanilla, bay, and spices.

The station program is divided into major lines of work as follows:

1. Insecticidal crop investigations (rotenone).
2. Drug crops investigations (particularly quinine).
3. Food crop investigations.
4. Plant introduction and propagation.
5. Control of insect pests and plant diseases, by introduction of natural enemies and other means.
6. Investigations on crops of local importance in cooperation with the Government of Puerto Rico and other agencies.

Selected Examples of Recent Progress

1. Preliminary investigations on rubber cultivation conducted in cooperation with the Bureau of Plant Industry, Soils, and Agricultural Engineering indicate that low fertility generally found in this plant is not due to genetic difficulties but rather is probably due to pollen incompatability or failure of fertilization. It was found that two different species of insects may effectively pollinate rubber under Puerto Rican conditions. This is the first positive evidence of insect pollination in Hevea. This discovery is a long step toward the development of better methods of fertilization of this plant and expands the possibility of eventually developing highly productive disease resistant hybrids.

2. The cooperative program for breeding of sweetpotatoes to develop hybrids between the moist flesh and Jersey types was continued. Four additional varieties of the Jersey type flowered during the year to bring to seven the number of Jersey varieties now flowering at Mayaguez. More than twice as many hybrid seeds were produced as during 1949. This activity is basic to an extensive sweetpotato improvement program being conducted cooperatively by the Department and several State experiment stations, since such hybrids can be produced initially only under tropical conditions.

3. Weed control experiments concerning the effect of temperature, soil moisture, and soil texture on the persistence and movement of sodium trichloroacetate (TCA) in the soil, showed that toxicity disappeared more rapidly at higher temperatures and in soils with high moisture content. The herbicide tended to persist longer in heavy clay soils. There was practically no movement of TCA in the soil without rainfall. With an inch of rainfall, TCA moved down to at least 8 inches below the soil surface but enough TCA remained in the surface inch of soil to prevent germination of corn. In direct contrast, sodium 2,4-D did not move beyond the surface inch of the soil, and very little beyond the first half inch regardless of the amount of rainfall following its application. Field experiments with TCA in the control of weeds in sugarcane indicate that when this herbicide is used as a preplanting treatment, it kills or holds in check most of the grass weeds, and when used in combination with 2,4-D sprays, will control most of the weeds which develop before the cane closes over.

4. During the year an intensive survey was carried out to determine the prevalence of beneficial insects introduced into Puerto Rico by the station in previous years to assist in control of harmful insects. A considerable number of parasites and predators were found to be established and effecting control. These include bamboo and coconut scale predators and parasites of the sugarcane borer. Shipments of sugarcane borer parasites established in Puerto Rico were sent to Mexico at the request of that government.

5. In the past, it has been difficult to secure good stands of Guinea grass because of low viability of seed. Through investigation it was found that this grass tends to shed poor seeds before shedding more viable seeds. By delaying the start of seed collection 10 to 14 days, 96 to 100 percent of the total viable seeds are recovered and overall fertility is greatly increased. This information is of immediate interest and commercial importance.

6. One of the principal difficulties encountered in expanding use of improved bamboos introduced by the station has been the fact that bamboo very rarely flowers and seeds, making it necessary to propagate bamboo by clump divisions which weigh approximately 25 lbs. each. In cooperation with the Office of Foreign Agricultural Relations, a series of experiments was initiated in an effort to find a satisfactory means of producing large numbers of small rooted plants of selected species of bamboo so as to effect economy in material, labor, and transportation to new planting sites. Promising results have been obtained using whole cuttings, branch cuttings, and root cuttings. It is of interest to note that the various bamboo species have responded quite differently to the various methods of treatment, some being highly successful in one type of propagation, and others with another.

7. The biological method of testing toxicity of insecticidal plant material (using guppies as subjects), was perfected during the year to enable more accurate evaluation of material of low rotenone content. This method of testing also was modified to make possible the determination of DDT residues in vegetables. Because of its high degree of sensitivity and simple technique, this biological method will be useful in other aspects of DDT toxicology.

STATEMENT OF OBLIGATIONS UNDER ALLOTMENTS

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Research and Marketing Act of 1946 (Title II), Department of Agriculture (Office of Experiment Stations):			
Marketing research and service	$303,144	$311,000	$286,000
TOTAL, OBLIGATIONS UNDER ALLOTMENTS	$303,144	$311,000	$286,000

BUREAU OF HUMAN NUTRITION AND HOME ECONOMICS

Purpose Statement

The Bureau was established on July 1, 1923, absorbing the Office of Home Economics which had been in existence since 1915 as an enlargement of the Human Nutrition Investigations authorized by the Congress in 1894.

Research is carried on through laboratory and field studies in cooperation, wherever possible, with other bureaus of the Department, other Federal agencies, and with State research agencies, particularly State agricultural experiment stations. Studies include research on:

Food and nutrition, to determine the nutritive contributions of different foods to the diet, the comparative costs of foods, the food and nutritional requirements of people, and how these facts can be applied by families in differing circumstances to the buying of food, the preparation of healthful meals, and the preservation and care of food in the home.

Family economics, to determine the quantities of different foods and other goods and services consumed by families in various regional and economic groups; an evaluation of the economy and nutritional adequacy of diets and a study of the factors such as income, prices, and family size that affect family expenditures for living.

Textiles and clothing, to determine the relative usefulness and cost of fabrics and garments differing in material, construction, design, and finish, for the purpose of developing specifications for products that better meet consumer needs, and of assisting consumers in their selection and care of fabrics, garments, and household textiles for various uses.

Housing and household equipment, to determine the housing needs of families for efficiency and comfort, as a basis for developing plans for rural houses and for adequate and efficient work and storage centers, and to assist families with the selection, care, and use of household equipment.

Laboratory work is performed at the Agricultural Research Center, Beltsville, Maryland, and at sixteen locations in cooperation with research institutions in the States. The staff employed on November 30, 1950, numbered 318, of whom 193 were located in the field.

	Estimated, 1951	Budget estimate, 1952
Appropriated funds	$1,483,100	$1,482,500

Salaries and Expenses

Appropriation Act, 1951	$1,500,000
Reduction pursuant to Section 1214	-15,000
Activities transferred in 1952 estimates to "Salaries and expenses, Office of Information" for distribution of motion pictures	-1,900
Base for 1952	1,483,100
Budget Estimate, 1952	1,482,500
Decrease (due to providing a direct appropriation to the General Services Administration for certain procurement costs previously paid from this appropriation)	-600

PROJECT STATEMENT

Project	1950	1951 (estimated)	Decrease (GSA adjustment)	1952 (estimated)
1. Food and nutrition investigations	$811,393	$694,000	-$300	$693,700
2. Family economics investigations	470,589	383,000	- -	383,000
3. Textiles and clothing investigations	270,392	234,700	-200	234,500
4. Housing and household equipment investigations	210,111	171,400	-100	171,300
Unobligated balance	9,332	- -	- -	- -
Total available	1,771,817	1,483,100	-600	1,482,500
Transfers in 1951 estimates from:				
"Research and Marketing Act of 1946, Department of Agriculture"	-837,528	- -		
"Special research fund, Department of Agriculture"	-30,111			
"Salaries and expenses, Farm Housing, Department of Agriculture"	-9,490	- -		
"Salaries and expenses, Marketing Services"	-27,199	- -		
Transfer in 1952 estimates to "Salaries and expenses, Office of Information, Department of Agriculture"	+1,211	+1,900		
Reduction pursuant to Section 1214	- -	+15,000		
Total appropriation or estimate	868,700	1,500,000		

STATUS OF PROGRAM

Current Activities: The research of the Bureau of Human Nutrition and Home Economics consists of both laboratory and field investigations, many under cooperative or contract arrangements with other research organizations. It includes:

1. Food and Nutrition: Determining the nutritional requirements of people; the composition and nutritive value of food to meet these needs; the best use of agricultural products, including food selection, care of food in the home, and the most suitable methods of home food preparation and preservation.

   Current research includes studies of the requirements of children and young people for selected nutrients; food intake in relation to nutritional status; the physiological availability of food energy, carotene, and ascorbic acid from selected foods; the distribution in foods of selected amino and fatty acids, folic acid, and pantothenic acid; improved methods of household preparation as related to food quality; development of recipes for effective home, school and other institutional use; and investigations of food spoilage organisms as related to food conservation.

2. Family Economics: Investigating problems of household buying, and the adequacy and relative economy of the food, clothing and other goods and services that are consumed by various population groups, particularly the major items of household expenditure which serve as indicators of farm family living standards.

   Special emphasis is being given to studies of levels of living achieved by farm families and of factors affecting the food consumption and dietary adequacy of urban and rural families; periodic appraisal of the nutrient content of national food supplies; and compilation of available data on the composition of foods as marketed and as prepared for eating.

3. Textiles and Clothing: Emphasizing studies to assist homemakers with the selection, use and care of family clothing and to help producers in the development of fibers, fabrics and garments for specific consumer uses.

   Research is in progress on technical problems pertaining to consumer use and quality of clothing and household textiles; serviceability in actual use of fabrics of known composition and construction; causes of deterioration of fabrics during use; and the relative efficiency of various household detergents in fabric reconditioning.

4. Housing and Household Equipment: Involving studies of the housing needs of families and development of plans for rural houses with efficient work areas, adequate storage space, and arrangements for satisfying family living; and research to improve the selection, care and use of household equipment.

Work under way includes cooperative development of house plans for the Southern Regional Plan Exchange Service; completion of reports on housing needs and preferences of families (cooperative with experiment stations in the Western and Southern regions); determination of adequate space and other facilities for effective home food preservation; studies of the operating characteristics of home laundry equipment.

Selected Examples of Recent Progress. Following are examples of progress in these fields during the past year.

1. Family food consumption. The results of food consumption surveys conducted in 1948-49 among urban families have been published in a series of ten summaries dealing with individual commodities, such as "Fruit Selections", and in 14 other reports providing comparative data for different cities. These studies enable estimates to be made of present and potential utilization of agricultural products among city families, classified by income, place of residence, and seasonal practices. Programs to expand consumption and to improve nutrition are aided by these findings. The data give figures on quantities bought and expenditures for the major food groups and many individual items, percentage of families buying, and the nutritive value of the diets. They are being widely used by marketing analysts, educators, and administrators.

2. Food analyses. Over 140 foods have been analyzed for folic acid content, a recently discovered vitamin for which comprehensive and quantitative data are needed. Analyses are also being made of nutritionally important fatty acids and of essential amino acids in raw and cooked food samples, and methods are being developed for determining the quantitative distribution of other less well-known nutrients in common foods.

3. Food composition tables. Comprehensive new tables summarizing current knowledge on the nutritive value of about 750 food items give data on cooked and uncooked foods for nutritionists, teachers, physicians, homemakers, economists and others needing such facts to calculate dietaries or to compare the relative value and economy of different foods.

4. Quantity service recipes. Following recommendations of the Department's commodity advisory committees, recipes are being developed to stimulate use of abundant foods in institutions and restaurants. First issues of "Recipes for Quantity Service" have been published and are being distributed upon request to about 10,000 hospitals, residence halls, restaurants, Federal prisons, State institutions, Extension workers and others concerned with serving food to large groups.

5. Dry milk. Information on the nutritive value, storage and use in cooking of dry milk, whole and nonfat, along with more than 50 recipes, was developed and distributed to families through a 32-page leaflet "How to Use Whole and Nonfat Dry Milk".

6. Apples. An examination of more than 1,700 samples of apples available to consumers in retail stores during the winter and spring months of 1947-48 and 1948-49 showed that losses due to bruises were greater than to rots, cuts, insect injury and internal breakdown, and that the yield of edible material was 77 and 73 percent respectively in the two years. This work was cooperative with the State agricultural experiment stations of the North Central Region.

7. Bacteriological studies related to home canning. Laboratory findings have shown that certain of the naturally occurring vitamins or their synthetic analogs can either increase or decrease the resistance to heat of organisms causing spoilage in canned food. Further study of these effects may result in methods for treating foods before canning so as to reduce the heat processes required for sterilization.

8. Selection and use of home food freezers. A popular bulletin recently published gives information for prospective purchasers and users of home food freezers. It includes a discussion of the cost of owning and operating a freezer, the design, construction, and refrigerating mechanism of typical kinds and suggestions for using this piece of household equipment. Tables have been formulated to enable families to determine readily the size of freezer they need.

9. Effect of fiber content on serviceability of a staple household textile. Laboratory evaluation of 7 bed sheetings containing various proportions of cotton and rayon showed that as the proportion of cotton in the sheetings increased, the breaking strength, resistance to abrasion and dimensional stability increased.

10. Serviceability of cotton clothing fabrics differing in construction. Nearly a thousand work dresses made under contract from a uniform pattern but utilizing percales of different quality (based on thread count) are being examined at regular intervals during wear at Washington, Kansas and Michigan State Colleges, and at the University of Maryland. Marked differences in the fabrics' resistance to wear in different parts of the garments are being observed. Some high count percales withstood 60 wear periods (equivalent to about 28 months of average wear and laundering by a homemaker), whereas in many instances the medium and low count fabrics were worn out after 45 wear periods (equivalent to about 21 months of ordinary service).

11. Studies of family clothing supplies. The clothing inventories of 514 Minneapolis-St. Paul, Minnesota families, classified by income, have been analyzed in a recent report. Figures are available not only for the average number of still usable garments (about 55 items) in the wardrobes of family members, but also for garments made of cotton, wool, and other fibers.

12. Financing house improvements. Based in part on a study of the experiences of a group of families of North Central States, a new bulletin "Using Credit to Finance Farmhouse Improvements" outlines financial considerations important whether the financing is with

credit or with cash. The pamphlet was written primarily for extension agents, teachers and others who help farm families plan remodeling and modernizing of their houses.

13. Housing needs and preferences. More than 4,000 rural families in 43 states have been interviewed regarding their housing needs and preferences in a survey by the Bureau and 29 State agricultural experiment stations. The Northeastern regional report has been published; the North Central one is in press and the Southern and Western ones are in preparation. The data will give guidance to architects and others concerned with planning houses adapted to rural family life.

14. Household utensils. A buying guide for homemakers has been published which discusses materials, design and construction features of utensils needed for cooking family meals. The lists were established by a Bureau study in cooperation with California, Nebraska, and Rhode Island experiment stations to include both minimum and desirable standards of need.

STATEMENT OF OBLIGATIONS UNDER ALLOTMENTS AND WORKING FUNDS

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Research and Marketing Act of 1946 (Title II), Department of Agriculture (Bureau of Human Nutrition and Home Economics):			
Marketing research and services	$10,126	$10,000	$10,000
National School Lunch Program, Department of Agriculture (Bureau of Human Nutrition and Home Economics):			
Nutritional requirements of school feeding programs ...	27,122	25,000	25,000
Working Fund, Agriculture, Agricultural Research Administration (Bureau of Human Nutrition and Home Economics):			
To compile and furnish tables of food composition values	- -	2,200	- -
TOTAL, OBLIGATIONS UNDER ALLOTMENTS AND WORKING FUNDS	37,248	37,200	35,000

BUREAU OF ANIMAL INDUSTRY

Purpose Statement

The Bureau of Animal Industry, established by the Act of May 29, 1884, conducts research and administers a program primarily concerned with the protection and development of the livestock, meat, poultry, and related industries.

1. Research includes:

   a. Experiments on the improvement of livestock (except dairy cattle), poultry and domestic fur animals, together with studies of methods of improving the quality and usefulness of their products.

   b. Investigations of diseases and parasites affecting all classes of livestock, poultry, and domestic fur animals.

2. Protective measures include:

   a. Inspection of animals and poultry at ports of entry, together with inspection and supervision of animal products or materials permitted entry under restrictions, in order to exclude diseases of foreign origin, particularly such dangerous diseases as foot-and-mouth disease and rinderpest, and examination for purposes of identification of purebred animals offered for entry free of duty.

   b. Inspection of livestock offered for export and of facilities on transporting vessels to assure their humane handling and safe transport.

   c. Control of interstate movement of livestock to detect and prevent the spread of communicable diseases, including inspection of all animals received at the larger stockyards; and administration of the 28-hour law which is designed to prevent cruelty to animals in interstate transportation.

   d. Supervision of the preparation of veterinary biological products to assure their purity and potency, and administration of a marketing agreement and order designed to maintain adequate supplies of hog cholera virus and anti-hog cholera serum.

   e. Control and eradication of diseases in the field, such as tuberculosis, brucellosis, cattle fever ticks, cattle and sheep scabies, hog cholera and related swine diseases, dourine of horses, etc., and of such diseases as foot-and-mouth disease, European fowl pest, etc., when such diseases occur in the United States.

f. Federal meat inspection under the Meat Inspection Act, the Horse Meat Act, and the Imported Meat Act, and regulations promulgated thereunder having for their purpose the production of a clean and wholesome meat supply for human consumption.

g. Cooperation with Mexico in the control and eradication of foot-and-mouth disease there, including related research in European laboratories and a program (conducted through the Production and Marketing Administration) for the sale of canned meat and meat products purchased in northern Mexico in previous fiscal years, and assisting the Commodity Credit Corporation in the fiscal year 1951 in the purchase of frozen beef in Mexico to fill needs of ECA countries. Purchase of canned meat was considerably reduced in the fiscal year 1950 and was discontinued February 28, 1950. Protective measures in the United States are also pursued which include patrol of the Mexican-United States border to prevent entry of animals susceptible to the disease and to supervise the handling of any materials which might harbor the virus, as well as strengthened inspections at public stockyards and in the field to detect immediately any possible introduction of foot-and-mouth disease in the United States.

h. Inspection and certification of canned animal foods upon application of manufacturers, financed by fees covered into the Treasury.

The Bureau maintains a central office in Washington, D. C., but most of its work is conducted in the field. Its stations, substations and laboratories are located in 455 cities and towns in the United States and Territories, and at 46 cooperating agricultural experiment stations. Work is also conducted in the field in Mexico and at 3 European research laboratories. Employees are engaged in work on farms, ranches, ports of entry into the United States, meat packing establishments, public stockyards, establishments licensed under the Virus Serum Toxin Act, etc. On November 30, 1950, there were 6,611 full-time employees, 429 of whom were in Washington and the remainder in the field; and 252 part-time employees who work intermittently in the field.

	Estimated, 1951	Budget estimate, 1952
Appropriated funds	$24,235,100	a/ $57,550,000

a/ Includes $32,700,000 to reimburse Commodity Credit Corporation for funds advanced and expenses incurred in fiscal year 1950 for control and eradication of foot-and-mouth disease.

Summary of Appropriations, 1951 and Estimates, 1952

(Note.--Amounts in brackets [ ] are not included in totals.)

Item	Total estimated available, 1951 a/	Budget estimates, 1952	Increase (+) or Decrease (-)
Salaries and expenses:			
Animal research	$3,528,200	$3,539,400	+$11,200
Animal disease control and eradication	7,907,300	7,868,000	-39,300
Marketing agreements, hog cholera virus and serum ..	b/ [49,300]	49,300	+49,300
Meat inspection	12,799,600	13,393,300	+593,700
Total, salaries and expenses	24,235,100	24,850,000	+614,900
Eradication of foot-and-mouth and other contagious diseases of animals and poultry	c/	c/32,700,000	c/+32,700,000
Total, direct annual appropriation	24,235,100	57,550,000	+33,314,900

a/ Adjusted for comparability with the appropriation structure proposed in the 1952 Budget Estimates.

b/ Transfer from appropriation made by section 12(a) of the Agricultural Adjustment Act, approved May 12, 1933.

c/ In addition to prior year balances of $5,923,680 and $443,616 available in fiscal years 1950 and 1951, respectively, the 1950 and 1951 Agricultural Appropriation Acts authorized the Secretary to transfer from any funds available to the Department amounts necessary to finance the foot-and-mouth disease eradication program, subject to later reimbursement when an appropriation therefor is made. Similar authority is proposed for the fiscal year 1952 pending determination of the financial requirements of the program. The 1952 Budget Estimates propose an appropriation of $32,700,000 to repay Commodity Credit Corporation for amounts advanced to finance the program in the fiscal year 1950.

Salaries and Expenses

The Budget estimates propose the consolidation of the two current subappropriation items "Animal husbandry" and "Diseases of Animals" into a single subappropriation item to be known as "Animal research". This proposal would simplify the appropriation structure and the administrative functions of the Bureau and would in no way affect the nature or scope of the work being conducted. The following table compares the existing appropriation and project structure for these items with that proposed in the 1952 Budget estimates:

PROPOSED CONSOLIDATION OF APPROPRIATION ITEMS OR REVISIONS OF ACTIVITY SCHEDULES

Salaries and Expenses, Bureau of Animal Industry
(Based on Amounts Appropriated)
(Note.—Amounts in brackets [ ] are not included in totals.)

Present Structure		Proposed Structure			
		Appro. Item	Financial Project		
Appropriation Items or Financial Projects	Total Amount	Animal Research	Animal Husbandry	Infectious and non-infectious diseases of animals	Parasites and parasitic diseases of animals
ANIMAL HUSBANDRY	$2,294,000	$2,294,000	$2,294,000		
Swine husbandry investigations	389,703				
Sheep and goat husbandry investigations	389,582				
Horse and mule husbandry investigations	56,897				
Beef cattle husbandry investigations	508,101				
Dual-purpose cattle husbandry investigations	98,209				
Poultry husbandry investigations	748,507				
Fur animal husbandry investigations	103,001				
DISEASES OF ANIMALS	$1,325,000	1,325,000			
Investigations of brucellosis (contagious abortion) of livestock	229,872			$229,872	
Investigations of infectious diseases of livestock and poultry caused by bacteria and fungi, other than brucellosis	190,128			190,128	
Investigations of infectious diseases of livestock and poultry caused by viruses	179,207			179,207	
Investigations of non-infectious diseases of livestock and poultry	160,225			160,225	
Investigations of protozoan parasites of livestock and poultry, including coccidiosis	138,244				$138,244

(Continued on next page)

Present Structure		Proposed Structure			
		Appro. Item	Financial Project		
Appropriation Items or Financial Projects	Total Amount	Animal Research	Animal Husbandry	Infectious and non-infectious diseases of animals	Parasites and parasitic diseases of animals
DISEASES OF ANIMALS Cont'd					
Investigations of worm parasites of livestock and poultry, such as tapeworms, flukes, and round-worms	$172,780				$172,780
Investigations of miscellaneous parasites of livestock and poultry	67,536				67,536
Investigations of treatments for parasites of livestock and poultry	131,225				131,225
Investigations of diseases and parasites of fur animals	55,783			$39,036	16,747
Subtotal, above items for which revisions are proposed	3,619,000	3,619,000	2,294,000	798,468	526,532
ANIMAL DISEASE CONTROL AND ERADICATION	7,950,000				
Eradicating tuberculosis and Bang's disease	6,218,180				
Eradicating scabies	117,686				
Eradicating cattle ticks	318,474				
Control of hog cholera and related swine diseases	35,648				
Determining the existence of diseases in the field	24,136				
Import-export inspection and quarantine	375,421				
Supervision over interstate movement of livestock	453,250				
Control of manufacture, importations and shipment of viruses, serums, toxins, etc.	407,205				
MARKETING AGREEMENTS, HOG CHOLERA VIRUS AND SERUM	[49,300]				

(Continued on next page)

Present Structure		Proposed Structure			
		Appro. Item	Financial Project		
Appropriation Items or Financial Projects	Total Amount	Animal Research	Animal Husbandry	Infectious and non-infectious diseases of animals	Parasites and parasitic diseases of animals
MEAT INSPECTION	$12,800,000				
Meat inspection operations at packing plants under the Federal meat inspection service	12,576,000				
Determination of adulterations and other objectionable conditions in meat and meat food products by laboratory analysis	146,000				
Inspection of imported meats and meat food products	47,000				
Chemical, pathological, and zoological investigations relating to meat inspection .	31,000				
TOTAL APPROPRIATION	24,369,000				

(a) Salaries and Expenses

	Animal Research	Animal Disease Control and Eradication	Marketing Agreements, Hog Cholera Virus and Serum	Meat Inspection	Total
Appropriation Act, 1951 (adjusted - see proposed structure, page 127)	$3,619,000	$7,950,000	- -	$12,800,000	$24,369,000
Reduction pursuant to Section 1214	-89,000	-42,000	- -	- -	-131,000
Activities transferred in 1952 estimates to "Salaries and expenses, Office of Information" for distribution of motion pictures	-1,800	-700	- -	-400	-2,900
Base for 1952	3,528,200	7,907,300	- -	12,799,600	24,235,100
Budget estimate, 1952	3,539,400	7,868,000	49,300	13,393,300	24,850,000
Net increase	+11,200	-39,300	+49,300	+593,700	+614,900

SUMMARY OF INCREASES AND DECREASES, 1952

Animal Research

For investigations to develop improved and more economical means for control of hog cholera	+$48,600
Decrease resulting from closing out of horse breeding work at Middlebury, Vermont	-34,000
Decrease due to providing a direct appropriation to the General Services Administration for certain procurement and leasing costs previously paid from this appropriation .	-3,400
Subtotal	+11,200

Animal Disease Control and Eradication

Decrease for cattle tick eradication work in Florida	-10,000
Decrease due to providing a direct appropriation to the General Services Administration for certain procurement and leasing costs previously paid from this appropriation .	-29,300
Subtotal	-39,300

Marketing Agreements, Hog Cholera Virus and Serum

To provide a direct appropriation for marketing agreements, hog cholera virus and serum, in lieu of annual transfer from the appropriation made by section 12(a) of the Agricultural Adjustment Act, approved May 12, 1933 ..... +$49,300

Meat Inspection

To provide for more adequate enforcement of laws relating to meat inspection ..... +600,000

Decrease due to providing a direct appropriation to the General Services Administration for certain procurement and leasing costs previously paid from this appropriation -6,300

Subtotal ..... +593,700

PROJECT STATEMENT

Project	1950	1951 (estimated)	Increase or decrease: GSA Adjustment	Increase or decrease: Other	1952 (estimated)
1. Animal research:					
a. Animal husbandry	$2,256,453	$2,235,432	-$1,549	-$34,000(1)	$2,199,883
(1) Swine husbandry investigations ...	(375,354)	(386,285)	(-300)	- -	(385,985)
(2) Sheep and goat husbandry investigations	(381,764)	(373,923)	(-300)	- -	(373,623)
(3) Horse and mule husbandry investigations	(54,492)	(46,366)	- -	(-34,000)	(12,366)
(4) Beef cattle husbandry investigations	(477,240)	(497,795)	(-300)	- -	(497,495)
(5) Dual-purpose cattle husbandry investigations ...	(101,043)	(98,084)	(-75)	- -	(98,009)
(6) Poultry husbandry investigations ...	(744,696)	(731,509)	(-500)	- -	(731,009)
(7) Fur animal husbandry investigations	(96,179)	(101,470)	(-74)	- -	(101,396)
(8) Liquidation of Agriculture Remount Service	(25,685)	- -	- -	- -	- -

(Continued on next page)

Project	1950	1951 (estimated)	Increase or decrease: GSA adjustment	Increase or decrease: Other	1952 (estimated)
b. Infectious and non-infectious diseases of animals	$812,236	$778,449	-$452	+$48,600(2)	$826,597
(1) Cattle	(409,043)	(363,241)	(-452)	- -	(362,789)
(2) Swine	(189,644)	(215,409)	- -	(48,600)	(264,009)
(3) Sheep and goats	(27,758)	(26,765)	- -	- -	(26,765)
(4) Horses	(45,580)	(24,032)	- -	- -	(24,032)
(5) Poultry	(101,692)	(110,871)	- -	- -	(110,871)
(6) Fur animals	(38,519)	(38,131)	- -	- -	(38,131)
c. Parasites and parasitic diseases of animals	498,623	514,319	-1,399	- -	512,920
(1) Cattle	(131,359)	(147,274)	(-150)	- -	(147,124)
(2) Swine	(56,318)	(59,222)	- -	- -	(59,222)
(3) Sheep and goats	(72,870)	(84,294)	(-1,249)	- -	(83,045)
(4) Poultry	(38,252)	(37,124)	- -	- -	(37,124)
(5) Fur animals	(16,241)	(16,360)	- -	- -	(16,360)
(6) Treatments	(131,386)	(129,762)	- -	- -	(129,762)
(7) Miscellaneous parasite investigations	(52,197)	(40,283)	- -	- -	(40,283)
Subtotal	3,567,312	3,528,200	-3,400	+14,600	3,539,400
2. Animal disease control and eradication:					
a. Eradicating tuberculosis and Bang's disease	6,309,873	6,217,662	-26,399	- -	6,191,263
b. Eradicating scabies	108,041	116,486	-740	- -	115,746
c. Eradicating cattle ticks	309,539	293,474	-245	-10,000(3)	283,229
d. Control of hog cholera and related swine diseases	23,377	35,648	-31	- -	35,617
e. Determing the existence of diseases in the field	11,336	13,954	-12	- -	13,942
f. Import-export inspection and quarantine	317,559	374,121	-368	- -	373,753
g. Supervision over interstate movement of livestock	456,882	450,360	-555	- -	449,805
h. Control of manufacture, importation and shipment of viruses, serums, toxins, etc	397,505	405,595	-950	- -	404,645
Subtotal	7,934,112	7,907,300	-29,300	-10,000	7,868,000

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Project	1950	1951 (estimated)	Increase or decrease: GSA Adjustment	Increase or decrease: Other	1952 (estimated)
3. Marketing agreements, hog cholera virus and serum	- -	- -	- -	+$49,300(4)	$49,300
4. Meat inspection:					
a. Meat inspection operations at packing plants under the Federal meat inspection service	$12,542,894	$12,575,600	-$6,300	+600,000(5)	13,169,300
b. Determination of adulterations and other objectionable conditions in meat and meat food products by laboratory analysis	146,052	146,000	- -	- -	146,000
c. Inspection of imported meats and meat food products	47,336	47,000	- -	- -	47,000
d. Chemical, pathological, and zoological investigations relating to meat inspection	39,757	31,000	- -	- -	31,000
Subtotal	12,776,039	12,799,600	-6,300	+600,000	13,393,300
Unobligated balance	+93,097	- -	- -	- -	- -
Total available	24,370,560	24,235,100	-39,000	+653,900	24,850,000
Transfer in 1950 to "Eradication of foot-and-mouth and other contagious diseases of animals and poultry, Agricultural Research Administration, Department of Agriculture"	+15,000	- -			
Transfer in 1951 estimates from: "Research and Marketing Act, 1946, Department of Agriculture"	-774,094	- -			

(Continued on next page)

Project	1950	1951 (estimated)
Transfer in 1951 estimates from: Cont. "Special Research Fund, Department of Agriculture"	-$398,346	- -
Transfer in 1952 estimates to "Salaries and Expenses, Office of Information, Department of Agriculture"	+1,980	+$2,900
Reduction pursuant to Section 1214	- -	+131,000
Total appropriation or estimate	23,215,100	24,369,000

INCREASES AND DECREASES

Animal Research:

(1) A decrease of $34,000 under the project "Horse and mule husbandry investigations" resulting from the closing out of horse breeding work at Middlebury, Vermont:

The 1951 Budget Estimates recommended the closing of horse breeding work at the station at Middlebury, Vermont by December 31, 1950. Congress concurred in the recommendation for discontinuance of the work but extended the time for closing to June 30, 1951, in order to allow time for the State Legislature to consider a proposal that the Vermont Agricultural College take over the station. Negotiations are now under way for transfer of the station and legislation authorizing the transfer was introduced in the 81st Congress. (S. 4235)

(2) An increase of $48,600 under the project "Infectious and non-infectious diseases of animals" for investigations to develop improved and more economical means for control of hog cholera:

Need for Increase: The development of measures for the control of a variant type of hog cholera which was identified by the Bureau in 1949 are urgently needed.

In July 1949 heavy losses in swine in the Middle West occurred following vaccination with the serum-virus treatment against hog cholera. Animals that should have been immunized died, apparently as a result of vaccination, despite the fact that the serum and virus had passed all the regulations of the Bureau of Animal Industry. Bureau investigators have determined that the apparent cause was a variant of the hog cholera virus against which the serum failed to protect adequately. Detailed investigations are needed to account for the appearance of this variant and to develop information that will lead to adequate control procedures for use on farms, and to develop measures to detect the variant types of virus should they appear in products of the various commercial plants producing hog cholera serum and virus.

Investigations of losses in 1949 by Bureau veterinarians and practicing veterinarians showed that in more than 250 herds which had been contacted, more than 4,800 pigs had died of cholera following vaccination which could be attributed to the presence of the hog cholera variant virus. The herds observed were only a few of those in which trouble developed, and the deaths reported were only those that had occurred in the herds up to the time of observation. Many deaths occurred later in these herds. The same condition again appeared to a very grave extent in the summer of 1950, following the usual vaccination methods.

The losses have shaken the confidence of farmers using the serum-virus treatment against hog cholera, which method in the past has done much to protect the swine industry against the devastations

of hog cholera. There has been general demand from livestock owners, livestock sanitary officials, scientists, and others, for the Bureau to develop information on this condition and protective measures against it. The events of the past two years have greatly emphasized the importance and the need for an accelerated research program on hog cholera.

Hog cholera presently causes more losses to the swine industry in this country than any other disease. Prior to the Bureau's development of simultaneous treatment for the disease (i.e., with serum and virus) substantially greater losses were caused by it. Although the use of this treatment has served to stabilize the swine industry for years, there are still many problems to be solved on newer and more economical methods of immunization against the type of hog cholera which has prevailed in this country for many years. Such research, of course, would now be complicated by the presence of a variant type.

Plan of Work: The work needed to solve the problems presented by the recognition of a variant virus would be of a fundamental nature and directed along several lines, as follows:

(a) It appears that in the propagation of virus certain pigs (including some that are treated by the simultaneous injection of virus and serum) are responsible for the production of variants. Therefore, experiments would be initiated in swine to determine the factors that might be responsible for the appearance of variant types of hog cholera virus; i.e., why they occur and under what conditions the pigs are capable of producing the variant.

(b) Viruses would be propagated by different methods, such as propagation with and without simultaneous administration of serum, for the purpose of finding a method of more uniformly propagating satisfactory variant virus that retains its variant characteristics.

(c) Hyperimmune serums would be prepared from pigs treated with variant viruses for the purpose of developing serums that will protect in standard doses against all forms of cholera.

(d) Vaccines would also be prepared from variant viruses for the purpose of producing vaccines that would protect against all forms of hog cholera.

(e) Pigs of various ages, from susceptible sows and also from sows immunized by different methods, would be tested for their relative resistance to variant virus.

(f) Investigations would be made of losses that follow serum-virus treatment whenever considered advisable, in order to obtain more information regarding the clinical picture, to obtain any unusual strain of virus that may appear, and to correlate laboratory and field observations.

(3) A decrease of $10,000 under the project "Eradicating cattle ticks" for eradication activities in Florida:

The Third Deficiency Appropriation Act, 1949, provided $60,000 to eradicate an outbreak of cattle fever ticks in Florida. The progress made in eradication has been such that the area was released from quarantine December 1, 1950. Since a number of agents engaged on this work were released in the first quarter of the fiscal year 1951, a decrease of $25,000 was made a part of the reduction in funds appropriated under the General Appropriation Act, 1951 pursuant to Section 1214 of that Act. A further reduction of $10,000 will be possible for the fiscal year 1952.

In 1952 and thereafter it is planned to maintain about 6 employees in Florida -- 2 veterinarians and 4 lay assistants -- to make periodic inspections of the former quarantined area to assure that no ticks remain and to investigate reports of suspected outbreaks.

Marketing Agreements, Hog Cholera Virus and Serum:

(4) Increase of $49,300 in direct appropriation to provide funds in lieu of annual transfer from the appropriation made by section 12(a) of the Agricultural Adjustment Act, approved May 12, 1933:

Need for Direct Appropriation: Work under this item was begun in the fiscal year 1937 to carry out the provisions of sections 56 to 60 of the Act of August 24, 1935, (7 U.S.C. 851-855) which sets forth the policy of Congress (1) to assure maintenance of an adequate supply of hog cholera virus and anti-hog cholera serum by regulating their marketing in interstate and foreign commerce and (2) to prevent undue and excessive fluctuations, unfair methods of competition, and unfair practices in such marketing. As authorized by Agricultural Appropriation Acts each year, this project has been financed since its inception by allotments from the appropriation made by section 12(a) of the Agriculture Adjustment Act, approved May 12, 1933. Since this appropriation is now exhausted, a direct appropriation is needed in order to carry out the provisions of the law. The law is designed, through stabilization of the industry, to protect swine producers from excessive losses from hog cholera brought about by inadequate supplies of hog cholera virus and anti-hog cholera serum. The need is a continuing one.

Meat Inspection:

(5) An increase of $600,000 for the Meat Inspection Service to provide more adequate enforcement of the laws relating to meat inspection.

Need for Increase: All commercial meat packers and processors who ship their products in interstate or foreign commerce must have federal inspection pursuant to the meat inspection laws. Present inspection at many points is far from adequate because funds are not sufficient to maintain an inspection staff which can meet minimum needs and assure that meat and meat food products are wholesome and fit for human consumption.

Inspection work is integrated with production facilities in a plant. Inadequate numbers of inspectors adversely affect production because it becomes a physical impossibility to inspect the volume of output in step with maximum plant capacity. Livestock producers and meat consumers, as well as meat packers, benefit from efficient utilization of plant facilities by reduced unit production costs. To handle livestock offered for sale at public markets it is important for maximum facilities of slaughtering departments to be utilized. If meat packers are unable to utilize facilities fully, livestock will at times back up in yards, resulting in depressed livestock prices, holdover losses to producers, increased unit production costs to packers, and higher prices to consumers.

Three factors very largely determine the number of inspectors needed. They are (1) the number of inspected establishments, (2) their location, and (3) the volume and kind of meat to be inspected. The number of establishments served in 1950 was 928 located in 363 cities and towns and there are indications that these factors will show some slight increase in 1951 and 1952. Volume of inspections is also expected to increase in the fiscal years 1951 and 1952. Indications are that the livestock population will exceed present high levels. It is expected that demands for inspected meats for both domestic and military consumption will increase. The increase in hog slaughter is estimated at about 5 percent in 1951 and cattle slaughter at about 2 percent. In 1952 further increases are anticipated. Hog slaughter is expected to increase about 3 percent and cattle and calves about 5 percent. A slight decrease in sheep slaughter is anticipated in 1951, with approximately the same slaughter in 1952 as in 1951. Because of the nature of inspection required and the problems encountered more inspectors are required to inspect a given number of cattle than hogs and more inspectors are required for hogs than the same number of sheep or calves.

The following table shows a comparison of slaughter in 1949 and 1950 with anticipated slaughter in 1951 and 1952:

	Fiscal Year 1949	Fiscal Year 1950	Estimated Fiscal Year 1951	Estimated Fiscal Year 1952
Cattle	13,182,962	13,115,889	13,378,000	14,046,000
Calves	6,749,001	6,234,261	6,235,000	6,546,000
Sheep	13,894,311	12,246,809	12,120,000	12,120,000
Goats	262,064	122,233	122,000	122,000
Swine	49,062,663	55,764,636	58,553,000	60,309,000
Horses	307,785	240,010	230,000	225,000
Total	83,458,786	87,723,838	90,638,000	93,368,000

During the fiscal years 1950 and 1951 it has been necessary to absorb a considerable part of the salary increases required by legislation - general pay adjustments required by Public Law 429 and automatic within-grade promotions. Since more than 97 percent of the expenditures under this appropriation are for the salaries of full-time personnel the only way to absorb these increased costs is to reduce the number of inspectors. In addition to increased salary costs, there have been general increases in costs for travel, communications, etc. The cumulative effect of these absorptions has resulted in restricting numbers of inspectors and thereby curtailing the effectiveness of the meat inspection service.

Inspected establishments feel that since Federal inspection of operations at their plants is mandatory, the Federal Government should provide inspectors in sufficient number for orderly and efficient conduct of operations. Failure to meet this responsibility retards meat packing operations because inspection is an essential part of the production line process. A number of packers have objected particularly to the lack of sufficient veterinarians to maintain a smooth flow of carcasses and thus permit slaughtering to proceed in an orderly manner. When veterinarians are not available to make disposition of diseased conditions it has been necessary for lay assistants to hold carcasses and viscera until a veterinarian is available to make proper disposition. These packers have also complained that because it is necessary to hold viscera and because they have not found it possible to provide equipment which will hold each set of viscera separate, they often lose edible product because it becomes contaminated while awaiting the availability of a veterinarian to inspect and dispose of the product.

Plan of Work: The meat-packing business is highly competitive and operates on a "small margin of profit--quick turnover" basis. As a result, when operations at one point become unprofitable, especially in case of smaller plants, the activity may be transferred to another point. New businesses also arise to replace discontinued firms. This constant shift in points where inspection is required makes it impossible for us to prognosticate future operations other than on the basis of total inspection requirements for the country as a whole. However, on the basis of present inspection requirements and projected overall increase in meat production, it is presently estimated that the additional inspectors will be needed at the following stations:

Station	Veterinarians	Lay Assistants
Albany, New York	1	- -
Albert Lea, Minnesota	1	1
Atlanta, Georgia	1	- -
Austin, Minnesota	2	2
Baltimore, Maryland	1	1
Bristol, Virginia	- -	1
Cedar Rapids, Iowa	2	- -
Chicago, Illinois	11	5
Cincinnati, Ohio	2	1
Cleveland, Ohio	2	1
Columbus, Ohio	- -	1
Davenport, Iowa	- -	1
Dayton, Ohio	1	- -
Des Moines, Iowa	2	1
Detroit, Michigan	1	- -
Dubuque, Iowa	2	1
Duluth, Minnesota	1	- -
Eau Claire, Wisconsin	1	- -
Fort Branch, Indiana	1	1
Fort Dodge, Iowa	2	1
Fort Worth, Texas	2	- -
Huron, South Dakota	1	- -
Indianapolis, Indiana	3	2
Kansas City, Kansas	5	3
Los Angeles, California	3	- -
Louisville, Kentucky	2	- -
Mason City, Iowa	1	- -
Memphis, Tennessee	- -	1
Milwaukee, Wisconsin	4	1
Moultrie, Georgia	1	- -
Muncie, Indiana	1	- -
Nashville, Tennessee	- -	2
New York, New York	2	2
Oklahoma City, Oklahoma	2	- -
Omaha, Nebraska	7	4
Ottumwa, Iowa	2	2
Philadelphia, Pennsylvania	- -	2
Piqua, Ohio	1	- -
Pittsburgh, Pennsylvania	- -	1
Portland, Oregon	1	1
Pueblo, Colorado	1	- -
Reading, Pennsylvania	- -	1
St. Louis, Missouri	6	3
San Francisco, California	1	1
Sioux City, Iowa	5	3
Sioux Falls, South Dakota	2	1
South St. Joseph, Missouri	3	3
South St. Paul, Minnesota	5	4
Spokane, Washington	1	1
Storm Lake, Iowa	1	1
Topeka, Kansas	1	- -
Waterloo, Iowa	3	3
West Fargo, North Dakota	1	- -
Winona, Minnesota	1	1
Total	103	61

The main lines of work requiring the bulk of inspection personnel are as follows:

(a) Ante-mortem inspection. Live animals are examined before they go into packing plants to eliminate animals unfit for food purposes. When lay assistants are used, they segregate abnormal animals for disposition by veterinarians. Screening by ante-mortem inspection is carried on at all inspected slaughtering establishments.

(b) Post-mortem inspection. Thorough examination is made of each carcass. All diseased carcasses and parts are condemned and rendered unfit for human food. Most of the veterinarians and their lay assistants are engaged in this inspection work. They must be located at inspection points continuously throughout the slaughter. Carcasses which pass inspection go into the meat food processing operations. Condemned material is placed in tanks under the direct control of the inspectors where it is rendered into fertilizer, inedible fats, etc. As cattle and hog slaughter increases additional inspectors are required to assure an even flow of work.

(c) Inspection of processing and manufacture of meat and meat food products. Inspectors are responsible for sanitation and for seeing that there is no adulteration of meat food products. Some products, such as sausage or any chopped meat products, lend themselves very readily to adulteration. Curtailments heretofore made in meat inspection have weakened particularly inspection at this point since it has been necessary to withdraw inspectors experienced in this field for urgent assignments in ante-mortem and post-mostem operations. While this procedure aids the meat inspection service in meeting its responsibilities in the integrated operations of slaughtering plants it does weaken an important phase of the total meat inspection job required by law.

The 103 additional veterinarians would be employed on ante-mortem and post-mortem inspection to assure that operations move in an orderly and efficient manner and would release lay assistants for reassignment to processing work to relieve shortages there. The 61 additional lay assistants would be assigned to processing inspection. The following table shows the net change in positions which would occur from the increase:

Distribution of Positions

	Ante-mortem Inspection	Post-mortem Inspection	Processing Inspection	Total
Veterinarians				
New positions	+7	+96	- -	+103
Lay Assistants				
New positions	- -	- -	+61	+61
Reassignments	-7	-70	+77	- -
Net change	- -	+26	+138	+164

CHANGES IN LANGUAGE

The estimates include proposed language changes as follows (new language underscored; deleted matter enclosed in brackets):

Animal Research: For animal husbandry investigations; investigations of diseases of animals and of tuberculin, serums, antitoxins, and analogous products; and cooperation in the ad-
1 ministration of regulations for the improvement of poultry, poultry products, and hatcheries, as authorized by law (7 U.S.C. 429, Public Law 662, approved August 4, 1950); $3,539,400.

[Animal husbandry: For investigations and experiments in animal husbandry and animal and poultry feeding and breeding, and for carrying out the purposes of section 101(b) of the Organic Act of 1944 (7 U.S.C. 429) authorizing cooperation with State authorities in the administration of regulations for the improvement of poultry, poultry products, and hatcheries, $2,294,000.]

[Diseases of animals: For scientific investigations of diseases of animals, and for investigations of tuberculin, serums, antitoxins, and analogous products, $1,325,000, including not to exceed $8,000 for the purchase of land and appurtenances near Ames, Iowa, for continuation of a hog cholera experiment station.]

Animal disease control and eradication: For the control and
2 eradication[, including inspections and quarantines,] of tuberculosis and paratuberculosis of animals, avian tuberculosis, Bang's disease of cattle, scabies in sheep and cattle, southern cattle ticks, hog cholera and related swine diseases, and
3 dourine in horses, and other inspection and quarantine work; for supervision of the transportation of livestock, including administration of the twenty-eight-hour law; for inspection of vessels; and for carrying out the provisions of the Act of March 4, 1913 (21 U.S.C. 151-158), relating to veterinary biological products, [$7,950,000] $7,868,000, including $30,000 for the acquisition of land and construction of buildings for inspection of livestock at Canadian border ports of entry: Provided, That no payment hereunder as compensation for any cattle condemned for slaughter for tuberculosis, paratuberculosis, or Bang's disease shall exceed (1) $25 for any grade animal or $50 for any purebred animal, (2) one-third of the difference between the appraised value and the value of salvage thereof, or (3) the amount paid or to be paid by the State or other cooperating agency, and no payment hereunder shall be made for any animal if at the time of test or condemnation it shall belong to or be upon the premises of any person, firm, or corporation to which it has been sold, shipped, or delivered
4 for slaughter[: Provided further, That inspection service shall be maintained at all stockyards having such service during the current fiscal year].

[Marketing Agreements, Hog Cholera Virus and Serum]

[The sum of $49,300 of the appropriation made by section 12(a) of the Agricultural Adjustment Act, approved May 12, 1933 (7 U.S.C. 612), is hereby made available during the fiscal year
5 for which appropriations are herein made to carry] Marketing agreements, hog cholera virus and serum: For carrying into effect sections 56 to 60, inclusive, of the Act approved
6 August 24, 1935 (7 U.S.C. 851-855) regulating the marketing of anti-hog-cholera serum and hog-cholera virus, $49,300.

Meat inspection: For carrying out the provisions of laws relating to Federal inspection of meat and meat-food products,
7 [$12,800,000] including the purchase of one passenger motor vehicle for replacement only, $13,393,300.

The first change in language proposes the deletion of the language under the sub-appropriations "Animal Husbandry" and "Diseases of Animals" and to combine them under a single subappropriation item "Animal Research". The sole purpose of this change is to simplify the appropriation structure and the administration of the Bureau, and will in no way affect the nature or scope of the research work being conducted.

The second and third changes propose deletion of the words "including inspections and quarantines" and inclusion of the word "other" solely for the purpose of simplifying the wording of the item.

The fourth change proposes deletion of the provision included in the 1951 Appropriation Act under the subappropriation item "Animal Disease Control and Eradication" requiring inspection at all public stockyards having such service during the past fiscal year. A similar stipulation was also included in the appropriation acts for the fiscal year 1948, 1949, and 1950.

This requirement has now become a serious handicap to efficient administration of the stockyards inspection service which is considered to be of prime importance to the livestock industry of the country. The purpose of this inspection is the early detection of diseases at market centers to prevent widespread dissemination through trade channels. Under the provision, inspection at yards cannot be withdrawn even though changed conditions may be such that continued inspection provides very little protection to the livestock industry.

For example, inspection cannot be withdrawn from such places as the Waldhauser Feed Yards and Bookey-Williams Cattle Company Stockyards at Clovis, New Mexico, now operating principally as feed lots. Another class of stockyards, such as Mississippi Valley Stockyards at St. Louis, Missouri, the Richmond Union Stock Yards at Richmond, Virginia, and others, have developed into little more than terminal stockyards for immediate slaughter animals. On the other hand, available funds are not sufficient to inaugurate inspection service at several markets, among which are the Billings Livestock Commission, Billings, Montana, Springfield Livestock Market, Springfield, Missouri, and the Texarkana Livestock Company, Texarkana, Texas, from which there is now a wide distribution of livestock to country points and where inspection would therefore, provide important additional protection to the livestock industry.

The fifth and sixth changes in language are proposed to provide for a direct appropriation for marketing agreements, hog cholera virus and serum, work formerly financed by transfer from the appropriation made by section 12(a) of the Agricultural Adjustment Act, approved May 12, 1933, as funds available under section 12(a) are now exhausted.

The seventh change in language is for the purpose of providing authority to purchase a passenger motor vehicle for use in the local meat inspection field office which covers 14 inspected establishments located in the District of Columbia and at nearby points. The use of a car will result in the more efficient utilization of inspection personnel.

STATUS OF PROGRAM

ANIMAL RESEARCH

Animal Husbandry Investigations

Current activities include research directed toward more efficient breeding, feeding, and management of poultry, fur animals and all livestock, except dairy cattle. Activities also include research on factors affecting the production of high quality products and their processing and preservation.

There are on American farms approximately 41 million cattle raised primarily for meat, 10 million dual-purpose cattle, 58 million hogs, 30 million sheep, 500 million chickens, 500,000 fur bearing animals, 7 million horses and mules, and 2 million rabbits. These animals are producing barely enough meat to satisfy our present need. An increase in volume and efficiency of meat production is an urgent need. Through research in breeding, feeding, and management, it is possible to raise present levels of production and improve the quality of animal products.

Examples of Recent Progress:

(1) The effect of inbreeding upon performance in swine is one of average decline with considerable variation between breeding strains. However, it is still the most valuable tool available to the breeder for further improvement in the breeding qualities of his herd. Experiments show that an increase in inbreeding is in general accompanied by small litter size, lighter weights and smaller average daily gain from weaning to 225 pounds live weight. These declines are the same regardless of whether a given degree of inbreeding is attained slowly or quickly. The crossing of selected inbred lines more than fully restores the losses and is the only known method of improving inherent production ability with any degree of certainty.

(2) Beltsville strains of hogs continue to show improved meat yield. The inbred Landrace X Chester White and Landrace X Poland China strains of improved meat-type hogs showed a distinct improvement in yield of preferred cuts over that shown last year. These lines produced an average of 49.7 percent and 49.5 percent, respectively, of original line slaughter weight in total weight of hams, loins, bacon, picnic shoulders and shoulder butts, as compared with 48.9 percent for each line a year ago. With crosses between the various inbred lines, there was a general tendency toward an increase in length of carcass, increases in thickness of backfat and dressing percentage, and a slight decrease in percent yield of preferred cuts resulting from crossing the lines.

(3) Dressing percentage of hogs is not entirely dependent on fatness. Hogs may combine high dressing percentage and high meat yield. There is generally a strong correlation between fatness and

dressing percentage. However, the Landrace X Chester White and the Landrace X Poland China line in Beltsville show a very favorable combination of high dressing percentage and high yield of preferred cuts, which will increase their usefulness in swine breeding improvement.

(4) Microorganisms in meat were found to increase, rather than decrease, during freezer storage. Although commonly believed that freezing decreases the number of microorganisms in food, research conducted during the year with frozen pork demonstrated that the total number of bacteria present in the actually increased during freezer storage. Such increases occurred in meat stored at both 0°F. and 25° F., but was most marked in samples well protected from desiccation and stored at the latter temperature.

(5) Selection has improved economically important characters in range Rambouillet sheep at the Western Sheep Breeding Laboratory, Dubois, Idaho. Selective mating during the past 10 years has significantly increased staple length of wool, freedom from wool blindness and has improved mutton type. Over 85 percent of the expected genetic progress came from the selection of sires in a two-year period.

(6) Economic traits of Rambouillet rams were found to be significantly related. At Dubois, Idaho, correlations determined among economically important yearling and two-year-old Rambouillet ram traits have been used to develop a selection index for breeding rams. Highest relationships between traits in these rams were found to be those between clean-wool fleece weight and grease-wool weight and between condition of flesh and mutton type. Grease-wool fleece weight and clean-wool fleece weight were significantly correlated with staple length of wool, body weight, mutton type, condition of flesh and skin folds at the neck. Except for the latter, all were positive in the sense that excellence in one was associated with excellence in the other. The correlation of staple length of wool with clean-wool fleece weight was higher than with grease-wool fleece weight, but body weight, mutton type, condition of flesh, and skin folds had higher correlation with grease-wool fleece weight than with clean-wool fleece weight. It is necessary to take into account such relationships among the various economically important traits in order to select effectively for the improvement of more than one trait at the same time.

(7) Age of Navajo ewes is an important factor in their lamb production. In studies at the Southwestern Range and Sheep Breeding Laboratory, Fort Wingate, New Mexico it has been shown that a high level of lifetime lamb production can be attained by selecting breeding ewes for lamb producing ability at an early age. In Navajo sheep lifetime lamb production is of great importance because of the severe climatic conditions where they range.

(8) Genetic selection of Karakul sheep for improvement of lambskin fur. Extensive studies at Beltsville show clearly that heritability makes possible the genetic selection of Karakul breeding sheep for the improved production of lambskin fur having small and medium-size curl. The smaller curl sizes are generally preferred in the Karakul lambskin fur trade. The results indicate that the average curl size produced in a Karakul breeding flock can be shifted favorably by a few generations of selective breeding for this characteristic.

(9) Distillers' byproducts produced from fungal amylase converted mashes compare well with those produced by the conventional malt process. The feeding qualities of corn distillers' dried byproducts made by a newly developed process employing fungal amylase as the enzymatic converter to replace barley malt have been found to be almost if not equal to that of conventionally produced distillers' dried grains and solubles. These feeding tests were conducted at Beltsville on materials supplied through the cooperation of the Production and Marketing Administration and the Bureau of Agricultural and Industrial Chemistry.

(10) Weaning weight of beef calves related to important production factors. Production studies with beef cattle at Miles City indicate that there is some direct relationship between the birth weight of a calf and its gain from birth to weaning. The repeatability estimate of cow production for weight of calves at weaning (the relationship of the weaning weight of an individual cow's calves year after year) was .42, only moderately high.

(11) Weaning weight of beef calves influenced by age of dam. At Miles City, Montana, 6-year-old range cows produced calves with greatest average weaning weight. After 6 years of age calf weight decreased gradually until dams were 10 years old. Thereafter the decrease was very rapid. Birth weight, size and age of dam are important factors to be considered in selection for greater weaning weight of calf.

(12) Weaning weight of beef calves influenced by seasonal rainfall. At Miles City, Montana, weaning weight of calves decreased an average of 17 pounds for each inch of rainfall below $7\frac{1}{2}$ inches per growing season but increased only $\frac{1}{2}$ pound for each inch over $7\frac{1}{2}$, reflecting the influence of rainfall on forage and other factors.

(13) Brahman-sired calves heaviest at birth in Brooksville test. Calves sired by a Brahman bull out of cows of mixed breeding were significantly heavier at weaning than either those sired by a Hereford bull or by a Red Poll bull. The former averaged 334 pounds compared to 288 pounds for the Red Poll-sired calves and 296 for the Hereford-sired calves. The results indicate strongly the advantage of having some Brahman breeding in cattle raised for commercial beef production under Florida conditions.

(14) Self feeding a mixture of salt and cottonseed meal on the range is practical and reduces labor costs. For calves the mixture was 1 part salt to 4 parts cottonseed meal and for steers 1 part salt to 2 parts meal. The calves consumed 2 pounds cottonseed meal per herd daily and the steers 1 pound. Gains were nearly equal to those made on hand feeding similar amounts and no ill effects resulted from the high salt consumption.

(15) Reseeded pastures on abandoned crop-land produced more beef than did the native range at the Woodward Station. In tests conducted since 1937, the station's reseeded pastures on abandoned farm land of questionable value for crop production have supported more cattle and produced two to four times as much beef per acre as has well-managed native range. Pasture grasses used for reseeding have included sand love grass, weeping love grass, buffalo grass, a shortgrass mixture of blue grama, side-oats grama, Western wheatgrass, and Texas bluegrass, and a tall grass mixture of switchgrass, sand bluestem, little bluestem, and Indian grass.

(16) Grain feeding of fattening cattle on winter pasture in Georgia improved both gains and finish. The feeding of 6 parts ground snapped corn and 1 part cottonseed meal to steers grazing on excellent winter pasture of oats and crimson clover raised average daily gains to 3.45 pounds compared to 3.05 pounds per day produced by similar steers on pasture alone. The grain-fed steers graded Good as slaughter animals at the end of the 105-day test compared to Low Good for the steers fattened on pasture alone and brought $1.32 more per hundredweight.

(17) New pasture grasses are giving very promising results for winter maintenance of beef cattle in Florida. In a winter grazing test at the Brooksville station, in cooperation with the Bureau of Plant Industry, Soils, and Agricultural Engineering, the Soil Conservation Service, and the Florida Agricultural Experiment Station, 2-year-old heifers made 50 pounds gain per head during the 4-month winter grazing season on an Argentine Bahia pasture originally seeded in rows, with some common Bermuda, weeds, and other grass growth having volunteered between the rows. Similar heifers almost maintained their weight on a pasture of Pensacola Bahia for the 4-month winter season. Neither group received any supplemental feed except minerals. The results indicate the possibility of developing improved pastures for beef cattle production under Florida conditions.

(18) Meat production of cattle directly influenced by breeding. Recent meat studies conducted at Beltsville on both beef and dual-purpose cattle produced there and on beef cattle produced at Miles City show clearly that both the quantity and quality of meat produced are directly influenced by the breeding of the animals. Results of experiments with steer progeny of different

sires showed significant and material differences in important carcass and meat characteristics, such as dressing percentage, commercial grade fatness, and yield of preferred cuts, including the round, loin end, short loin, and rib muscling, which could be attributed only to the influence of the sires themselves.

(19) A new variety of Cornish chicken, called Silver Cornish, is being developed at Beltsville. Developed by crossing Brooksville Columbians (a variety itself developed at the Beltsville and Brooksville stations from Rhode Island Red, White Wyandotte and Light Sussex stock) with Dark Cornish, the new variety is designed to meet the need of the commercial broiler industry for chickens that grow and feather rapidly, lay a large number of eggs of high fertility and hatchability, and have broad breasts, large drumsticks, and white feathers, or at least light under-color. To date, the Silver Cornish compare very favorably with New Hampshires, Dark Cornish, and Dark Cornish X New Hampshire crossbreds with respect to growth, feathering, breast type, leg fleshing, and egg production.

(20) The growth-stimulating effect of the antibiotic, aureomycin, on chicks was confirmed at Beltsville during the year. The fact that the effect of a combination of vitamin B_{12} and an organic arsenic compound, 3-nitro, 4-hydroxphenylarsonic acid, in stimulating more rapid chick growth equalled that of a combination of B_{12} and aureomycin was also established. Although this suggested that the arsenic compound and aureomycin performed the same function when fed with B_{12}, the effect of all three in promoting chick growth was found to be greater than the effect of any two of them, indicating that all three have different functions. It seems likely that aureomycin and the arsenic compound stimulate growth indirectly due to their effects on intestinal microorganisms.

(21) Newcastle disease in laying flocks has a very unfavorable temporary effect upon egg production, but further experiments at Beltsville show that the disease produces long-lasting effects on the quality of the eggs of some hens which may be a more serious problem than the temporary effect on egg production itself. The disease appeared to have a 12-week effect on egg production, 6 weeks to the lowest level and 6 weeks before the normal production for that time of year was again attained. This temporary decrease was sufficient to affect average annual production. From the egg quality standpoint, eggs produced by a group of White Leghorn pullets that had recovered from the disease during April were significantly poorer in candling grades and albumen scores from June to November than were those of comparable pullets that had never had the disease. Average weight of the eggs from the recovered pullets was 22.7 ounces per dozen and from the uninfected pullets was 24.0 ounces.

(22) A new effect upon poultry of the so-called "germicidal" ultraviolet light has been discovered and studied at Beltsville. In 5 different experiments, each of 6 to 10 months duration, hens kept in the absence of sunlight but exposed continuously to light having a wave-length of 2538 anstrom units laid from 10 to 19 percent more eggs than did hens kept under the same conditions but without ultraviolet light. Previously the only known effect of ultraviolet light on poultry was the production of vitamin D. The new effect, however, was observed in chickens which obtained ample vitamin D from their diet and hence did not have to depend upon ultraviolet light for it.

(23) Better chicks and poults are available to the nation's farmers as a result of the operation of the National Poultry Improvement Plan and the National Turkey Improvement Plan. A major portion of the hatchery industry of the United States, representing 66 percent of the total egg capacity of the country, is voluntarily enrolled in the National Poultry Improvement Plan. The breeding phase of this plan has contributed materially to the increase of 17 eggs in the average rate of lay during the past five years. The status of work under the National Poultry and Turkey Improvement Plans is shown in the following table:

Item	1948 1/	1949 1/	1950
NATIONAL POULTRY IMPROVEMENT PLAN			
States	47	47	47
Hatcheries	4,354	4,438	4,637
Egg capacity of hatcheries	328,512,849	346,294,000	367,253,150
Hatchery-supply flocks	97,378	93,874	106,597
Birds in hatchery-supply flocks	27,290,523	27,409,109	34,700,337
Average percentage of reactors to pullorum test (first test)	1.18	0.86	0.72
U.S.R.O.P. (U.S. Record of Performance) breeders	295	286	2/
U.S.R.O.P. flocks	403	397	2/
Birds entered in trapnest flocks	197,497	198,866	2/
U.S.R.O.P. breeding pens	2/	4,712	2/
Females in U.S.R.O.P. breeding pens	63,839	70,848	2/
NATIONAL TURKEY IMPROVEMENT PLAN			
States	45	45	46
Hatcheries	674	768	815
Flocks	2,117	3,224	3,922
Birds	1,095,938	1,849,907	2,132,644
U.S.R.O.P. flocks	75	70	63
Single-tom matings	742	767	730
Candidates trapped	9,527	9,538	8,113
Average percentage of reactors to pullorum test (first test)	0.75	0.51	0.39

1/ Data on U.S.R.O.P. participation based on completed reports whereas data for previous years includes breeders who discontinued participation during the year.

2/ Information not available at time of reporting.

(24) Protein requirements of adult foxes for summer maintenance and fur growth were determined at the U. S. Fur Animal Experiment Station, Saratoga, New York. A protein level of 10 percent, dry basis, proved entirely inadequate for body maintenance. A 13 percent protein level produced similar deficiency symptoms, although less severe than at the 10 percent level. Foxes fed protein at a 16 percent level were maintained satisfactorily except that they failed to grow normal, finished pelts. Adult foxes of both sexes fed diets containing protein at levels of 19, 22, 25 and 28 percent were apparently normal in all respects, including the pelts produced.

(25) Because of the fundamental and field research (over a two-year period) on the use of hormones in an effort to increase the breeding efficiency of mink, the Bureau was able to give specific information as to the effect of feeding poultry waste from "caponettes". Caponettes are birds treated with the synthetic drug diethylstilbesterol to chemically castrate young roosters and thus improve the market quality of the meat. Experiments conducted by the Bureau have shown, however, that poultry waste devoid of heads from caponettes is a suitable and cheaper feed and may be used to replace the higher priced horse meat in the summer and fall mink ration.

Investigations of Infectious and Non-Infectious Diseases of Domestic Animals

Work in progress is directed toward diagnosis, cause, prevention, treatment and control of communicable diseases caused by bacteria, fungi, and viruses, such as brucellosis, tuberculosis, mastitis, hog cholera, swine erysipelas, fowl typhoid, and Newcastle and pullorum disease of poultry; non-infectious diseases and pathological conditions caused by metabolic disturbances, tumors, unhygienic practices, etc., and stock poisoning by plants. These diseases and conditions are responsible for annual losses in excess of 240 million dollars to livestock and poultry producers in this country. This research is contributing to the control of diseases of livestock and thereby improving efficiency of production.

Examples of Recent Progress:

(1) Increases in storage temperature of brucellosis strain 19 vaccine decreased the viability of both reconstituted desiccated vaccines and the Bureau's liquid vaccine. The retention of acceptable viability by vaccines appeared to be related to the stabilizing diluents employed. Vaccines containing a skim milk stabilizer had highest viabilities.

(2) Artificial insemination directly into the uterus of 12 cows using semen from a brucellosis infected bull produced infection in 8 of the animals, showing that this method constitutes a positive danger. Other methods of introducing semen into the cervix and vagina are being studied in this experiment.

(3) Aureomycin gave evidence of temporary relief but failed to eliminate Brucella abortus permanently from the udders of affected cows. Also test animals varied considerably in their ability to tolerate the drug. This indicated that the treatment is impractical under present circumstances since the drug is costly.

(4) In experiments with Brucella-infected sows about 25 percent of their suckling pigs showed evidence of infection at time of weaning or 2 weeks thereafter; the earliest age of infection was 6 weeks. Normal weanling gilts acquired Brucella suis infection after 3 months' exposure to infected weanling pigs. Normal weanling boars failed to contract the infection from contact with infected pigs of the same age. Brucella suis could not be isolated from any of the pigs which failed to show evidence of infection at time of weaning.

(5) During the height of the 1949 and 1950 serum-virus hog cholera vaccination seasons in some of the Corn Belt States many hogs sickened following vaccination and death losses were high. Investigations carried out in the field and the laboratories at Ames, Iowa, Washington, and Beltsville, revealed the cause to be a variant hog cholera virus against which the regular serum failed to protect. This was the first time a variant hog cholera virus had been postively identified in this country or abroad. It was also found that increased dosage of serum provided some protection. All licensed biological houses are testing their current viruses for the presence of the variant form, using means developed in Bureau studies.

(6) In swine erysipelas investigations, it has been found that an exposure method consisting of the introduction of virulent culture into a linear scarification of the skin of pigs provides a very promising method of determining whether an animal is immune to the infection. Heretofore, adequate means of testing the efficacy of a new vaccine in susceptible pigs has not been available. Work on the perfection of inactivated culture vaccines will be greatly enhanced by application of this method of exposure should it continue to prove satisfactory.

(7) Newcastle disease live-virus vaccines prepared by inoculating embryonated eggs with specially selected strains of virus have been found to give fairly good results when administered to chicks 4 or 5 weeks old or older. A new vaccine has been made available which may be used on chicks as young as one day but such chicks can not be shipped by mail since they develop a mild form of disease and are classed as spreaders of infection. Inactivated virus vaccines which produce lasting immunity have not as yet been prepared although attempts to do so have been made.

Virus inactivated by infrared irradiation in the presence of methylene blue was found to retain none of its antigenic properties.

(8) Difficulties due to the variant type of pullorum disease continued. During the past year flocks have been encountered in which a high percentage of birds reacted to the variant tube antigens with few reactors to the standard antigen, but examination of the reactors failed to reveal either variant or standard Salmonella pullorum, the cause of the disease. Coliform organisms were found, however, and in further tests birds sensitized with these organisms gave strong reactions to coliform and variant tube antigens but not to standard antigens. Further work is needed to develop antigens that will satisfactorily detect all types of pullorum disease and yet not give false reactions.

(9) The acute and chronic toxicity to livestock of a considerable number of the important newer insecticides when applied externally as sprays or dips and when ingested in treated forage has been determined. An important new surgical technique has been developed for obtaining samples of fat from the living animal for analysis for insecticide residues. Information on the clinical symptoms and the pathology of poisoning have been obtained and a motion picture of affected animals prepared for use of veterinarians.

(10) The best means of combating steatitis (yellowfat or nonsuppurative panniculitis) in mink is to change the ration so that it contains a large amount of fresh, unfrozen horse meat and to add 10 to 15 percent fresh liver. Limiting the food intake of those visibly affected is also a good procedure.

Current research includes work to develop methods of coping with internal and external parasites and the diseases they cause, such as coccidiosis of livestock and poultry, trichinosis of swine, stomach, intestinal, and lungworms of farm animals, liver flukes of ruminants, cattle grubs, and mange mites of livestock. Parasites are estimated conservatively to cause an annual loss in excess of 200 million dollars. This research is contributing to the control of parasites and parasitic diseases and thereby improving the efficiency of livestock production.

Examples of Recent Progress:

(1) Further improvement has been made in the complement-fixation test for detecting when cattle are carriers of anaplasmosis. Workers from a number of States have been given laboratory instructions in the practical application of this test. Antigen, one of the principal components used in the test, has been supplied to interested State agencies. Particular attention is being devoted to methods of producing a stable and standard antigen.

(2) Treatment of unweaned beef calves on Gulf Coast pastures with phenothiazine reduced their parasite load materially. Stomach worms, hookworms, and nodular worms, which are among the most injurious of the internal parasites of calves, were reduced by nearly 70 percent.

(3) Lindane proved effective in destroying lice on cattle and was well tolerated even by calves. Cattle owners who objected to the use of technical benzene hexachloride because of its offensive odor were satisfied to use lindane, which appears to be both safe and effective.

(4) Studies on cattle grub control in the Midwest and Southwest showed that the greatest reduction of these pests occurred where the work was done systematically year after year. An inadequate number of treatments during the grub season, or the introduction of untreated cattle into areas where treatment is in progress, may nullify in part the effort made to keep these pests under control.

(5) Mortality of dairy calves has been sharply reduced in areas in the South by the use of a portable pen devised by parasitologists of the U. S. Regional Animal Disease Research Laboratory, Auburn, Alabama. Each pen houses a single calf and is moved each week uphill to a new site. Coccidiosis, worm parasites, diarrhea and other diseases are evaded by this practice.

(6) A county-wide program of cattle grub control was initiated in the State of Washington through the cooperation of the owners of beef and dairy cattle. The vast majority of the grubs present in the animals were destroyed by spraying, dipping, washing, or dusting with rotenone-containing materials.

(7) Sheep in the Southwest were found to acquire the fringed tapeworm, a parasite of the liver, pancreas, and intestine, on the range. Tapeworm-free lambs placed in confinement on contaminated range became infested with the fringed tapeworm, which demonstrates that these parasites can be so acquired.

(8) Fluky beef and sheep livers must be frozen for at least 10 days at a temperature not higher than 15° F., or for a period of not less than 5 days at a temperature not higher than 10°F. in order to kill the fluke eggs. Unless this is done, the infected livers used as fish food may disseminate liver flukes to cattle, sheep, and other susceptible host animals through overflow of water at hatcheries into streams and pasture land.

(9) Larvae of intestinal wireworms penetrate deeply into the intestinal wall of lambs and destroy its delicate lining. The irritation so produced leads to scouring, emaciation and, in extreme cases, death.

(10) A new drug, known as Caricide, when given by mouth, was found in preliminary trials to cure filarial dermatosis, a debilitating skin and blood disease of sheep. The curative dosages, given over a period of 15 days, were well tolerated, and recovery took place about a week or so after completion of treatment.

(11) The curative value of phenothiazine, a drug used to expel stomach worms, nodular worms, and other damaging parasites from cattle, sheep, and goats, was not adversely affected when the drug was exposed to the air. Inasmuch as this drug is mixed with salt and placed before sheep to be eaten on a free-choice basis, this finding is of especial value to sheepmen throughout the country who have adopted the free-choice treatment.

(12) Scabies was eliminated from two bands of sheep, numbering 4,000 head, following a single dipping in dilute benzene hexachloride having 0.06 percent gamma isomer content. Post-dipping inspections, made up to 5 months in one band and 9 months in the other revealed no live mites. These trials were made under range conditions.

(13) Treating range sheep before or after shearing affords maximum relief from keds or ticks, and serves to protect the lambs from infestation or free them from it shortly after the pests have been acquired. Sheep keds or ticks were found to fluctuate sharply in numbers on range sheep during the year. The ticks reached the lowest level after shearing and increased in numbers gradually reaching their peak in the spring.

(14) About 15 percent of over 600 garbage-fed hogs and only 2 percent of approximately similar numbers of farm-raised hogs were found to be infected with trichinae, parasites that cause trichinosis in man. The average numbers of trichinae found in individual samples was smaller than those found in a similar survey prior to 1940.

(15) Pigs infected with shipworms, parasites of the large intestine, made weight gains only about one-third as large as those of comparable control pigs. Pigs heavily infected with these parasites died. Whipworms in varying numbers occur in a high percentage of pigs the country over.

(16) The decline of nearly 50 percent since 1947 in the incidence of hog mange in a midwestern area devoted to extensive swine production was traced to the substitution of benzene hexachloride and chlordane for the older, less effective treatments. These two chemicals were found by experiments conducted during the year to be highly destructive to mange mites.

(17) Chickens raised for the sixth year in succession on mash medicated with phenothiazine harbored on the average only about one cecal worm each, and none of the birds so raised died from blackhead. Comparable chickens, raised on regular mash, harbored

about 10 cecal worms each and 25 percent of them died of black head. This shows that a regime for the control of cecal worms should ultimately eliminate blackhead.

(18) Wild geese were found to harbor gizzard worms, cecal worms, and intestinal and kidney coccidia, transmissible to domestic geese. These and other parasites caused Canada geese at the Pea Island Wild Life Refuge in North Carolina to weaken and die. This shows that migratory birds can introduce disease and parasites which affect poultry.

(19) The low incidence of coccidiosis (7.5 percent) in rabbits in Southern California rabbitries resulted mostly from using self-cleaning hutch floors, and feeding and watering devices which tend to minimize contamination with the animals' droppings. Through the use of these control measures coccidiosis in rabbits can be reduced to negligible levels.

(20) Ear mange, a common disease of rabbits, was cured by instilling into the ears a 0.25 to 0.5 percent solution of lindane in oil. In California, where rabbit raising has attained the status of a sizable industry, about 11 percent of the mature rabbits were found to be affected with ear mange, a disease which can be controlled by the treatment given.

(21) Results of preliminary tests showed that ammonium hydroxide in a 5 or 10 percent concentration was the most promising of several fumigants tested for the destruction of coccidia of poultry. The effectiveness of the chemical in destroying coccidia was determined by observing the severity of coccidiosis produced in birds that were fed the fumigated parasites, which had succumbed to the treatment.

ANIMAL DISEASE CONTROL AND ERADICATION

Eradicating Tuberculosis and Bang's Disease

Current activities:

An extensive cooperative field program is conducted to eradicate tuberculosis and brucellosis (Bang's disease). Work is carried on in all States; tuberculosis eradication is also carried on in Hawaii, Puerto Rico, and the Virgin Islands, and brucellosis (Bang's disease) eradication in Puerto Rico. Indemnities are paid for cattle under certain legal and administrative restrictions.

Examples of Recent Progress:

(1) The low incidence of tuberculosis in cattle was maintained at 0.19 percent during the past fiscal year. Cattle tested numbered 9,439,811 as compared with 8,737,501 for the previous year; 17,733 reactors were removed from the 539,799 herds tested.

(2) The uniform program for nationwide brucellosis eradication has been adopted by 43 States and Puerto Rico, where existing laws and conditions would permit early use of recommended practices. A permanent national brucellosis committee representing all interested groups has been organized. Cooperative conferences were held with all interested groups in regional areas by the Extension Service and this Bureau, with the exception of the Western States, in previous fiscal years. A conference in the Northwestern States was held in September 1950.

(3) The incidence of brucellosis of cattle was further reduced from 4.0 to 3.5 percent during the past fiscal year. Testing was conducted in 618,801 herds containing 5,974,721 cattle, with 208,298 reactors being disclosed. Over 60,000 reactors were held in calf vaccinated herds for gradual disposal by slaughter without payment of indemnity.

(4) 432 counties located in 21 States, Puerto Rico, and the District of Columbia were listed as modified certified brucellosis-free areas. North Carolina, New Hampshire, and Maine are the only States in which all counties have qualified for that status, although some others are approaching it.

(5) Calf vaccination with Strain 19 vaccine increased 31.3 percent over the previous year. 2,065,063 calves between 4 and 8 months of age were officially vaccinated, bringing the total vaccinations since the inauguration of this practice in 1941 to 7,655,357.

(6) Funds provided by cooperating States and counties in the eradication of tuberculosis and brucellosis for the fiscal years 1950 and 1951 are approximately as follows:

	Tuberculosis		Brucellosis	
	1950	1951	1950	1951
Operating funds	$4,101,889	$4,539,280	$5,243,824	$6,019,507
Indemnity payments	1,212,492	1,313,467	2,490,289	1,929,821
Total	$5,314,381	$5,852,747	$7,734,113	$7,949,328

(7) The following tables show the average State and Federal indemnity payments and other data pertaining to the programs for control and eradication of tuberculosis and brucellosis.

RECORD OF TESTING FOR
TUBERCULOSIS AND BRUCELLOSIS
FISCAL YEAR 1950

State	Tuberculosis		Brucellosis			
	Cattle Tested	Percent Reactors	Cattle Tested	Percent Reactors	Reactors Held	Vaccinated
Alabama	46,474	0.07	57,289	3.7	191	73,538
Arizona	26,704	0.04	29,369	3.8	472	10,624
Arkansas	17,222	0.02	60,034	6.4	0	67,387
California	885,398	0.41	0	0.0	0	248,027
Colorado	24,927	0.01	81,884	3.8	2,155	57,249
Connecticut	173,221	0.17	27,305	1.8	0	18,756
Delaware	46,390	0.08	14,575	1.2	17	6,807
District of Columbia	189	0.0	189	0.0	0	0
Florida	101,436	0.04	98,403	7.0	13	17,173
Georgia	33,922	0.25	130,393	4.2	0	4,389
Idaho	30,527	0.05	41,742	3.0	293	54,238
Illinois	567,867	0.19	265,501	4.3	6,631	149,546
Indiana	192,108	0.21	178,837	6.0	0	14,122
Iowa	468,514	0.35	79,394	6.0	32	32,567
Kansas	368,732	0.12	82,315	6.0	4	1,466
Kentucky	32,400	0.19	50,356	4.3	832	8,592
Louisiana	9,180	0.13	50,098	9.7	42	41,176
Maine	64,187	0.09	181,606	1.4	1,453	6,966
Maryland	221,546	0.12	74,797	1.4	318	33,610
Massachusetts	199,626	0.19	168	0.0	0	8,002
Michigan	175,763	0.29	204,971	3.0	5,213	24,144
Minnesota	407,020	0.06	519,190	3.8	3,788	43,936
Mississippi	57,851	0.06	122,511	3.4	8	50,484
Missouri	139,916	0.04	128,198	7.0	0	14,589
Montana	16,924	0.03	38,938	3.4	444	48,126
Nebraska	120,221	0.10	27,751	7.3	0	6,690
Nevada	4,623	0.0	11,295	3.3	2	5,231
New Hampshire	106,587	0.01	154,012	1.0	68	10,491
New Jersey	228,803	0.1	92,286	0.8	334	18,025
New Mexico	15,716	0.04	41,686	0.9	9	9,797
New York	884,218	0.29	327,525	5.8	19,067	217,377
North Carolina	86,553	0.02	219,276	0.7	0	1,537
North Dakota	31,897	0.13	211,305	3.3	997	20,743
Ohio	495,737	0.19	182,437	3.2	0	73,418
Oklahoma	50,205	0.16	138,107	5.6	362	40,014
Oregon	202,493	0.05	261,688	1.4	0	26,585
Pennsylvania	518,865	0.25	432,670	1.9	374	78,892
Rhode Island	28,835	0.23	4,345	0.3	0	1,055
South Carolina	35,789	0.11	65,826	1.5	178	1,184
South Dakota	52,547	0.2	12,658	4.8	178	5,429
Tennessee	35,676	0.23	64,957	3.4	581	78,002
Texas	174,038	0.06	103,412	4.8	0	4,225
Utah	54,845	0.72	40,433	4.4	1,746	10,932
Vermont	231,940	0.26	70,471	5.1	3,626	41,268
Virginia	146,473	0.04	128,352	2.5	488	34,418

(Continued on next page)

State	Tuberculosis		Brucellosis			
	Cattle Tested	Percent Reactors	Cattle Tested	Percent Reactors	Reactors Held 1/	Calves Vaccinated
Washington	65,838	0.15	166,997	2.8	849	53,087
West Virginia	36,067	0.05	115,597	0.9	0	5,107
Wisconsin	1,383,994	0.1	451,839	3.7	8,757	255,186
Wyoming	19,391	0.2	30,376	3.3	8	21,456
Hawaii	13,296	0.19	0	0	0	0
Puerto Rico	107,120	0.03	101,357	2.0	1,156	9,400
Total	9,439,811	0.19	5,974,721	3.5	60,686	2,065,063

1/ Reactors held, usually in calf vaccination herds, for deferred slaughter when no longer of value for breeding or production purposes. No indemnity is paid on this class of reactor.

STATEMENT OF COMPARATIVE TESTING, HERDS AND CATTLE UNDER SUPERVISION, AVERAGE APPRAISAL, SALVAGE, AND STATE AND FEDERAL INDEMNITY IN BANG'S DISEASE ERADICATION WORK, FISCAL YEARS 1935 to 1950 INCLUSIVE

Fiscal Year	Tests Conducted		Reactors found	Percent infection	Under Supervision		Averages during year			
	Herds	Cattle			Herds	Cattle	Appraisal	Salvage	State Indemnity	Federal Indemnity
1935	212,482	3,317,760	381,010	11.5	187,109	2,936,347	$56.86	$ 19.87 1/	$ 27.99	$24.29
1936	470,788	6,674,709	457,104	6.8	449,644	5,780,418	70.65	27.44 2/	20.57	26.86
1937	630,917	8,021,167	397,864	5.0	719,452	7,877,612	70.67	27.94 3/	19.25	26.45
1938	671,310	7,837,443	324,532	4.1	1,035,454	9,447,137	80.37	32.07 4/	20.36	26.69
1939	724,613	7,591,398	219,165	2.9	1,372,410	11,111,643	97.17	33.97 5/	26.09	20.00
1940	590,393	6,937,428	171,953	2.5	1,615,755	12,315,329	90.85	34.99 6/	17.12	14.96
1941	677,544	7,465,254	182,075	2.4	1,883,914	13,932,693	93.28	37.68 7/	17.19	15.19
1942	591,835	6,891,219	209,238 a/	3.0	2,105,294	15,627,027	99.19	52.06 8/	17.71	15.83
1943	392,636	5,185,228	197,329 b/	3.8	2,199,535	16,616,522	128.03	64.87 9/	18.63	16.77
1944	386,266	5,235,912	226,079 c/	4.3	2,254,235	17,326,138	143.34	59.75 9/	22.54	19.30
1945	395,236	5,213,458	243,050 d/	4.7	2,307,585	17,545,638	139.35	56.63 9/	22.14	19.25
1946	389,814	4,876,866	245,786 e/	5.0	2,360,699	17,870,154	149.65	68.64 9/	22.07	19.34
1947	454,789	5,133,814	232,293 f/	4.5	2,249,118	17,589,018	178.25	82.93 9/	23.44	20.64
1948	533,936	5,434,792	232,199 g/	4.3	2,291,760	18,128,318	203.98	107.38 10/	24.44	21.17
1949	563,501	5,671,347	226,691 h/	4.0	2,165,364	17,126,480	256.46	132.11 11/	25.67	23.41
1950	618,801	5,974,721	208,298 i/	3.5	2,299,556	18,527,624	237.68	114.21 12/	25.16	22.75

1/ State indemnity paid in 1 State
2/ State indemnity paid in 2 States
3/ State indemnity paid in 5 States
4/ State indemnity paid in 10 States
5/ Beginning May 1, 1939, Federal indemnity payment limited to not exceed total amount paid by cooperating State agencies. State indemnity paid in 28 States
6/ Indemnities paid in 36 States
7/ Indemnities paid in 40 States
8/ Indemnities paid in 41 States
9/ Indemnities paid in 40 States and Puerto Rico
10/ Indemnities paid in 39 States and Puerto Rico
11/ Indemnities paid in 37 States and Puerto Rico
12/ Indemnities paid in 31 States and Puerto Rico

a/ Includes 39,586 reactors held in calfhood vaccinated herds for which Federal indemnity will not be paid.
b/ " 53,558 " " " " " " " " " " " " " "
c/ " 75,499 " " " " " " " " " " " " " "
d/ " 86,738 " " " " " " " " " " " " " "
e/ " 74,922 " " " " " " " " " " " " " "
f/ " 68,977 " " " " " " " " " " " " " "
g/ " 68,653 " " " " " " " " " " " " " "
h/ " 66,351 " " " " " " " " " " " " " "
i/ " 60,686 " " " " " " " " " " " " " "

STATEMENT OF COMPARATIVE TESTING, HERDS AND CATTLE UNDER SUPERVISION, MODIFIED ACCREDITED AREAS, AVERAGE APPRAISAL, SALVAGE, AND STATE AND FEDERAL INDEMNITY IN TUBERCULOSIS ERADICATION WORK
FISCAL YEARS 1935 to 1950 INCLUSIVE

Fiscal Year	Tests Conducted		Reactors found	Per-cent infec-tion	Under Supervision		Modi-fied accredi-ted areas*	Average during year			
	Herds	Cattle			Herds	Cattle		Appraisal	Salvage	State indemnity	Federal Indemnity
1935	2,378,668	25,237,532	376,623	1.5	6,590,863	48,768,627	2,428	$57.55	$15.19	$15.87	$18.70
1936	1,944,624	22,918,038	165,496	.7	6,515,273	59,907,935	2,921	77.66	26.50	10.18	22.44
1937	961,109	13,750,308	94,104	.7	6,745,471	61,640,711	3,030	86.04	28.94	12.20	22.72
1938	1,007,586	14,108,871	89,359	.6	6,471,538	62,640,358	3,124	86.76	32.16	16.41	18.12
1939	750,806	11,186,805	60,338	.5	6,372,720	60,439,030	3,142	89.01	34.49	18.96	15.97
1940	819,408	12,222,318	56,343	.46	6,191,330	61,570,426	3,148	91.05	37.12	20.44	16.20
1941	777,435	12,229,499	40,702	.3	6,235,198	62,696,167	3,151	96.50	40.99	20.95	16.48
1942	681,504	10,983,086	28,008	.26	6,320,006	63,073,213	3,151	109.69	50.35	21.49	16.55
1943	563,413	9,308,936	17,167	.18	6,317,670	63,846,496	3,151	135.19	65.03	27.50	18.75
1944	524,927	8,894,466	18,338	.2	6,153,069	64,519,652	3,151	154.53	59.93	36.07	21.72
1945	484,749	8,105,480	19,534	.24	6,120,528	64,790,921	3,151	161.32	59.78	40.31	22.71
1946	505,296	8,454,463	19,464	.23	6,035,783	65,981,099	3,150**	174.20	69.00	37.26	23.89
1947	515,517	8,312,919	16,666	.2	6,082,666	65,577.421	3,150	199.46	83.55	40.81	24.19
1948	523,924	8,294,423	15,943	.19	6,044,170	66,246,215	3,150	234.60	119.74	38.53	23.90
1949	536,162	8,737,501	17,007	.19	5,985,215	65,419,332	3,150	285.78	139.46	37.68	24.72
1950	539,799	9,439,811	17,733	.19	5,991,703	65,443,353	3,150	272.87	123.24	43.40	25.05

* Includes Puerto Rico and the Virgin Islands.
** Reduction is due to consolidation of two counties.

Eradicating Scabies

Current activities:

Inspection and dipping for cattle and sheep scabies is carried on cooperatively in 28 States. Premises and other specified areasare quarantined as required. These skin diseases are highly contagious and if unchecked cause great financial losses in flesh, unthrifty condition, arrested growth, and at times death losses are heavy. In sheep there is also a marked decrease in the quantity and quality of wool produced.

Examples of Recent Progress:

The dipping programs for eradication of sheep scabies have shown particularly good results in the past year in the States of Mississippi, Virginia, and West Virginia, and persistent efforts are being made to eradicate the infection completely in these States. Cooperative efforts have continued in other States on a lesser scale. Sheep cannot be grown profitably when affected with scabies. The rapid spread of this malady in farming areas emphasizes the need for prompt control measures.

In the State of Louisiana the most important sheep growing area is now under Federal quarantine because of rather extensive existence of sheep scabies. Inasmuch as Louisiana has considerable out-of-state trade in lambs the presence of scabies endangers sheep raising in other States. The State of Louisiana has recently appropriated funds for an intensive eradication program and it is hoped that such a campaign can be undertaken there in the near future.

Cooperative eradication of cattle scabies continued throughout the fiscal year 1950 on a reduced level.

Scabies eradication in the past fiscal year is indicated by the following table:

	Sheep		Cattle	
	F.Y.1949	F.Y. 1950	F.Y.1949	F.Y. 1950
Field inspection ..	5,813,900	5,978,587	958,998	319,366
Dippings	373,993	291,190	4,815	2,801
Infected animals ..	19,955	49,484	1,454	945
Exposed animals ...	25,870	70,979	415	525

Eradicating Cattle Ticks

Current activities:

The inspection and dipping for cattle fever ticks is carried on in close cooperation with State and County authorities and cattle owners in Florida and in parts of Texas and California adjacent to the Mexican Border. A systematic eradication program is also in progress in Puerto Rico. Originally over one fourth of the country was under quarantine for tick fever. At present the disease in the United States is limited to areas adjacent to Mexico. The danger of reinfestation is constantly present due to our close proximity to tick infested areas in Mexico and islands in the West Indies. Vigilance in dealing effectively with outbreaks that occur from time to time is of prime importance to the livestock industry of the South.

Examples of Recent Progress:

(1) Bureau and cooperative employees supervised 5,881,120 inspections or dippings of cattle for fever ticks and 599,528 inspections or dippings of horses and mules. In Puerto Rico, where inspections and dippings of cattle are conducted, it was also necessary to treat sheep and goats on infested premises, which required 683,326 inspections or dippings.

(2) The systematic tick eradication campaign in Florida has progressed satisfactorily and the quarantine has been lifted. Good cooperation was received from cattle owners and others interested. Inspections will be continued for some time to assure that the eradication campaign has been completely effective and that no further reinfestation occurs.

(3) In Texas, tick reinfestation from Mexico continues to be a constant source of danger to that State and adjacent areas. Several times during the past year fever ticks were introduced on stray and smuggled animals from this source. A narrow strip, approximately 500 miles, along the border from Del Rio to the Gulf of Mexico is under Federal quarantine and this area is regularly inspected by Bureau employees. It is expected reinfestations will continue to occur until some effective barrier can be placed along this line. All Mexican territory adjacent to the international boundary along the lower Rio Grande Valley is infested with fever ticks.

(4) In California, a new reinfestation of ticks occurred during November 1950 in San Diego County near the Mexican border. This outbreak

necessitates dippings and inspections on the premises involved and adjoining areas.

Control of Hog Cholera and Related Swine Diseases

Current activities:

Assistance is given to swine growers and others in preventing or controlling outbreaks of hog cholera and related swine diseases. Efforts are made to secure the widest application of the best known effective preventive and control measures in order to reduce swine losses from disease.

Examples of Recent Progress:

(1) The control of hog cholera and related swine diseases is now actively carried on in the principal hog raising States in the Corn Belt where the Nation's swine industry is largely concentrated. Hog cholera has been held in check in most of the Middle Western States with comparatively few losses reported except for a serious break in the Corn Belt area in which a considerable number of hogs died following simultaneous treatment. These post vaccination losses were attributed to the development of a variant virus. Assistance was rendered in investigating this outbreak in the States of Iowa, Nebraska and Minnesota.

(2) The incidence of swine erysipelas now ranks next in importance to hog cholera. Field veterinarians assisted in diagnosing the disease, selecting suitable herds for treatment, and checking the results obtained in the use of the serum-culture method of vaccination. During the year this treatment was applied by cooperative workers to 54,231 herds, containing 3,666,536 hogs, with very satisfactory results.

Determining the Existence of Diseases in the Field

Current activities:

Investigations are made of diseases which appear to be of a communicable nature in order that prompt control and eradication measures may be taken without delay. In recent years investigations for the most part have covered such diseases as dourine of horses, anthrax, and equine encephalomyelitis.

Examples of Recent Progress:

(1) Laboratory tests for dourine were made of 967 blood samples, 2 of which were positive. These infected animals were stray Mexican horses. The continued testing of horses for dourine is indicated so long as the disease exists on the Mexican side of the border. Its early detection is necessary in order to prevent dissemination of the disease into the United States.

(2) Sporadic outbreaks of anthrax were reported from California, Louisiana Nebraska, South Dakota and Texas. Bureau employees continued to

furnish assistance in administering preventive treatment against this disease to Indian-owned cattle on reservations.

Import-Export Inspection and Quarantine

Current activities:

Measures are taken to safeguard the livestock industry against serious losses by preventing the introduction of destructive communicable diseases, such as foot-and-mouth disease and rinderpest, from other countries. Work is conducted at sea, air, and border ports. Livestock offered for importation into this country are inspected and when necessary are quarantined. The importation of animal products, hay, straw, and similar materials which might be the means of introducing dangerous livestock diseases is also supervised. This includes prevention of the landing of meats as sea stores or cargo or of garbage derived from meats from countries where dangerous animal diseases exist.

Purebred animals are further examined at ports of entry for identification purposes to determine their eligibility for entry free of customs duty. Livestock offered for export are also inspected for diseases. Facilities on transporting vessels are required to meet rigid specifications to assure humane handling and safe transport of the animals.

Examples of Recent Progress:

(1) More than 621,000 animals were inspected for disease at ports of entry during the fiscal year 1950, 61 of which were detained for further observation and testing. Of the animals inspected 1,254 were refused entry on account of disease. Importations were as follows:

Ports of entry	Cattle	Swine	Sheep	Goats	Horses and Mules	Other
Ocean ports	847	721	455	1,982	445	41
Canadian border ports	518,296	1,144	72,063	20	21,252	--
Mexican border ports	--	--	--	--	4,505	--
Total	519,143	1,865	72,518	2,002	26,202	41

(2) The identification and certification of purebred animals for free entry, by species, was as follows: 245 horses; 22,227 cattle; 2,673 sheep; 960 swine; 9 goats; 808 dogs; 13 cats; a total of 26,935 for the fiscal year 1950.

(3) During the past fiscal year over 4 billion pounds of hides, glands and other animal products were imported. Animal products were transported to and handled at approximately 200 destination establishments. All railroad cars, trucks, and premises involved in the transportation and handling of products permitted entry subject to further restriction were cleaned and disinfected.

(4) Animals inspected for exportation during the past year are shown by species and country of destination in the following table:

Kind of animal	Canada	Mexico	Other Countries	Total
Cattle	725	2,106	8,478	11,309
Swine	14	177	858	1,049
Sheep	7	1,219	669	1,895
Goats	2	91	1,235	1,328
Horses	35	492	4,131	4,658
Mules	374	45	5,987	6,406
Total	1,157	4,130	21,358	26,645

Supervision over Interstate Movement of Livestock

Current activities:

Inspections are made of livestock received at the larger public markets in order to prevent the spread of disease. When diseases are found, appropriate control measures are taken. Railroad cars, trucks, chutes, alleys, pens, etc. are disinfected under Federal supervision as required. The existence of the disease is reported to the district of origin in order that steps may be taken promptly to localize or eradicate it. Measures are also undertaken to enforce the 28-hour law which is designed to prevent overconfinement of animals in interstate transit by common carrier; and to assure proper feeding, watering, and resting thereby reducing losses through shrinkage, injury, etc.

Examples of Recent Progress:

(1) Funds for inspection of livestock for communicable diseases at public stockyards. Since 1948, when there was a reduction of approximately 19% in the appropriation for inspection of livestock at public stockyards, it has been necessary to utilize funds made available from the item "Eradication of foot-and-mouth and other contagious diseases of animals and poultry" to maintain adequate inspection services. The annual appropriation acts from 1948 to 1951 have contained the proviso "that inspection service shall be maintained at all stockyards having such service during the current fiscal year."

(2) The inspection work at key locations makes possible early detection of important diseases and prompt action to prevent spread, and thereby safeguards the livestock population. Volume of work is reflected in the following tables:

Inspection at Public Stockyards

	Fiscal Year 1949	Fiscal Year 1950
Number of stockyards operating	48	48
Number of cities in which located	43	43
Animals inspected:		
Cattle	22,409,726	22,263,464
Sheep	16,230,899	14,305,409
Swine	26,499,422	30,382,663
Total animals inspected	65,140,047	66,951,536
Animals dipped and immunized:		
Cattle dipped	4,120	4,912
Sheep dipped	134,438	181,631
Swine immunized	238,436	249,226
Total animals dipped and immunized	376,994	435,769
Health certificates issued for shipments	164,085	170,251
Infectious cars received	155	198
Cars cleaned and disinfected	1,647	1,735
Trucks cleaned and disinfected	1,356	2,103
Diseased animals detected (excludes those reacting to tests for tuberculosis and brucellosis)	3,906	7,448

Enforcement of animal quarantine acts

Violations investigated by Bureau	24	10
Violations referred to the Solicitor of the Department	9	0

(3) Reports of violations of the 28-Hour Law during the past fiscal year numbered 391. In addition, 76 reported violations were under investigation at the beginning of the year. Recommendations were made to the Solicitor of the Department for the prosecution of 192 cases, 83 were filed without action on information accompanying the report, and 171 were placed in abeyance after investigation revealed that the cause of overconfinement excused the carrier. 21 cases were under investigation at the close of the year. Penalties aggregating $24,100 were imposed by the courts covering 239 violations. A statement of policy setting forth the Department's views regarding the minimum requirements of the law as to feeding and other services was issued by the Secretary's office. This statement was prepared after several conferences between officials of the Bureau and the Office of the Solicitor and representatives of the carriers, producers, packers, and others interested in the transportation of livestock.

Control of Manufacture, Importation, and Shipment of Viruses, Serums, Toxins, etc.

Current activities:

Work covers enforcement of the provisions of the Virus-Serum-Toxin Act to insure that all veterinary biological products manufactured under license will accomplish the purpose for which intended; to prevent marketing of products that are worthless, contaminated, dangerous or harmful; and to control the importation and interstate shipment of disease organisms, thereby protecting the nation's livestock and poultry industries against impure and impotent biological products and dissemination of disease through the uncontrolled movement of disease organisms and vectors.

Examples of Recent Progress:

(1) Outstanding licenses under the Virus-Serum-Toxin Act permitted production of 104 different biological products as of July 1, 1950. Several products are manufactured in more than one form, so that the total number of different products produced was 186. The progress and anticipated extent of work under the project is reflected in following table:

	Actual F. Y. 1950	Estimated F.Y. 1951	Estimated F.Y. 1952
(a) Establishments producing anti-hog-cholera serum and hog cholera virus	36	36	36
Production (cc):			
Serum (preserved product)	1,573,030,000	1,698,870,000	1,783,800,000
Virus:			
Simultaneous	97,868,000	105,697,000	110,982,000
Hyperimmunizing	318,050,500	343,495,000	360,670,000
Inoculating	1,226,200	1,320,400	1,386,400
Animal inspections	4,407,000	4,759,600	4,997,500
Tests supervised	15,000	16,200	17,000
(b) Establishments producing other biologics	40	38	38
Production:			
Cc	595,751,500	625,539,000	656,816,000
Milligrams	68,366,000	71,784,000	75,373,000
Disks	272,300	200,000	150,000
Units	617,568,000	636,095,000	655,178,000
(c) Products destroyed (all kinds):			
Cc	27,077,000	28,431,000	29,853,000
Milligrams	5,320,000	5,586,000	5,865,000
Disks	2,350	2,800	3,300
Units	17,512,000	18,037,000	18,578,000
(d) Export certificates issued	934	1,040	1,100

Marketing Agreements with Respect to Hog Cholera Virus and Serum

Current activities:

A marketing agreement has been entered into between the Secretary and handlers of anti-hog-cholera serum and hog-cholera virus to assure adequate supplies of these products, which are essential to routine immunization against hog-cholera and for use in emergencies arising from extensive outbreaks of the disease, thus assuring adequate hog production. The marketing order is designed also to prevent unfair trade practices, and undue and excessive price fluctuations. Work to insure compliance with the order includes assembling statistical data on production, sales, prices, and inventories, conducting investigations of alleged violations of the order, attending industry conferences, holding public hearings, and other administrative actions.

Examples of Recent Progress:

(1) Marketing Agreement and Order. A public hearing for the purpose of amending the order to provide that wholesalers bear a more equitable proportion of the expenses of the control agency was held during the year. Groups of producers and individuals have discussed trade matters on a number of occasions with personnel of the Bureau.

(2) Violations of Marketing Order. The Control Agency and representatives of the Bureau are continuing investigations and screening of all wholesalers under the order to determine if those so classified are continuing to conform to the requirements. Two Companies have been cited and will be investigated.

(3) Control Agency. Several meetings were held with representatives of the serum industry relating to the problem of a variant in hog-cholera virus. Expenses of representatives were financed by the Control Agency since the serum industry has no body representing the entire industry.

(4) The following table shows comparable figures by fiscal years of the number of handlers operating under the Marketing Agreement:

	Actual		Estimated	
	1949	1950	1951	1952
Producer-Handlers	34	33	33	33
Distributor-Handlers or equivalent including Wholesale Purchasers and Handlers	243	259	265	275

MEAT INSPECTION

Current activities:

Enforcement of the Federal meat inspection laws assures production of disease-free, clean, and wholesome meat and meat products for both civilian and military use and for foreign commerce. This is accomplished by supervising slaughtering and meat processing operations at meat packing plants, application of controls over imported meats to assure the same protection as in the case of meats produced domestically, and a system of certification of meats for export to keep foreign markets open to American meats. Work is also performed on a reimbursable basis for other Government agencies to assure specification compliance in governmental purchasing.

Examples of Recent Progress:

(1) Meat inspection volume increased in 1950. Reflecting substantial increase in the number of hogs marketed last year, total volume of meat inspection work expanded.

	1948	1949	1950
Number of establishments covered (at close of fiscal year)	940	928	928
Number of cities and towns in which establishments were located (at close of fiscal year)	372	364	363
Ante-mortem inspection:			
Animals passed	86,315,571	83,220,393	87,476,433
Animals suspected	220,805	240,002	249,281
Animals condemned	8,053	6,540	6,820
Total animals inspected	86,544,429	83,466,935	87,732,534
Post-mortem inspection:			
Carcasses passed	86,220,163	83,172,163	87,428,617
Carcasses condemned	314,486	286,623	295,221
Total carcasses inspected	86,534,649	83,458,786	87,723,838
Inspection of animals by species:			
Ante-mortem inspections (animals):			
Cattle	14,253,747	13,186,667	13,119,481
Calves	7,596,188	6,749,609	6,234,999
Sheep and lambs	15,628,789	13,895,500	12,247,510
Goats	271,626	262,064	122,240
Horses*	241,048	307,794	240,012
Swine	48,553,031	49,065,301	55,768,292
Total	86,544,429	83,466,935	87,732,534

(Continued on next page)

	1948	1949	1950
Post-mortem inspections (carcasses):			
Cattle	14,248,351	13,182,962	13,115,889
Calves	7,595,064	6,749,001	6,234,261
Sheep and lambs	15,627,907	13,894,311	12,246,809
Goats	271,603	262,064	122,233
Horses*	241,036	307,785	240,010
Swine	48,550,688	49,062,663	55,764,636
Total	86,534,649	83,458,786	87,723,838

*Horses are slaughtered and their meat is identified as such. It is handled and prepared in separate establishments from those handling cattle, calves, sheep, swine, and goats.

Meat and Meat Food Products Prepared and Processed Under Federal Inspection by Fiscal Years

Fiscal Year	Pounds
1945	13,408,978,079
1946	12,250,086,608
1947	11,888,911,964
1948	12,610,658,151
1949	13,381,083,144
1950	14,146,903,556

Examination of Meat and Meat Food Products for Other Government Agencies (Reimbursable)

Branch of Government	1948 (Pounds)	1949 (Pounds)	1950 (Pounds)
Department of the Navy	215,351,425	219,607,657	173,436,541
Commodity Credit Corp. (supply programs)	36,293,255	- -	12,313,413
Coast Guard	1,203,232	1,383,266	745,977
Marine Corps	461,997	12,204	10,714
Department of Interior	199,300	5,536	28,204
Veterans Administration	3,148,551	3,824,310	4,937,609
Department of the Army	86,149	94,489	91,990
Maritime Commission	62,752	7,192	- -
Department of Justice	76,084	157,297	90,813
All others	60,706	30,944	51,279
Total	256,943,451 1/	225,122,895 2/	191,706,540 3/

1/ Includes 3,049,722 pounds rejected.
2/ Includes 2,184,396 pounds rejected.
3/ Includes 1,858,679 pounds rejected.

Summary of Samples Examined in Laboratories for Determination of Adulteration or Other Objectionable Conditions, Fiscal Year 1950

	Number examined	Reported adversely
Meat and meat food products	12,844	1,940
Edible fats and oils	457	38
Cereals, spices, and condiments, dried skim milk, soya flour	5,532	114
Curing materials	1,886	59
Water	2,252	146
Miscellaneous	2,423	180
Samples of animal foods	61	3
Imports	982	272
Total	26,437	2,752

Meat and Meat Food Products Classified by Type of Product

Product	1948 Quantity (lbs)	1949 Quantity (lbs)	1950 Quantity (lbs)
Placed in cure:			
Beef	112,062,827	120,720,960	110,639,982
Pork	2,996,068,892	3,213,574,534	3,435,780,953
Smoked and/or dried:			
Beef	66,081,959	55,987,753	50,865,406
Pork	1,786,506,044	1,990,532,562	2,055,293,137
Sausage:			
Fresh finished	227,036,305	242,795,972	240,878,222
Smoked and/or cooked	971,645,660	961,851,503	961,719,027
To be dried or semi-dried	118,964,978	118,735,086	117,477,505
Loaf, headcheese, chili con carne, jellied products, etc.	188,939,595	180,369,664	177,679,181
Cooked meat:			
Beef	29,928,456	29,799,827	35,300,165
Pork	519,492,894	552,006,645	604,394,554
Canned meat and meat food products:			
Beef	133,647,742	107,112,944	93,522,249
Pork	466,447,872	469,894,388	532,835,662
Sausage	108,153,510	83,493,448	77,899,692
Soup	446,434,973	402,232,097	437,513,467
All other	412,838,087	425,945,237	402,635,605
Bacon, sliced	555,601,466	679,605,650	739,962,146
Lard:			
Rendered	1,597,280,620	1,680,868,655	1,871,395,554
Refined	1,187,190,093	1,354,200,766	1,340,627,407
Rendered pork fat:			
Rendered	79,773,805	90,387,324	108,571,605
Refined	43,749,988	54,840,402	58,201,056
Oleo stock	77,579,775	89,275,032	99,440,098

Product	1948 Quantity (lbs)	1949 Quantity (lbs)	1950 Quantity (lbs)
Edible tallow	69,143,099	75,697,290	66,642,581
Compound containing animal fat	250,937,300	202,775,520	237,856,460
Oleomargarine containing animal fat	24,115,763	26,390,268	22,510,055
Miscellaneous	76,886,836	91,065,049	228,758,118
Horse meat products:			
Cured	11,720,338	9,498,650	704,206
Chopped	21,243,479	25,274,771	27,951,791
Canned	30,620,858	43,108,666	7,067,033
Rendered fat	564,937	3,042,481	2,780,639
Total	12,610,658,151	13,381,083,144	14,146,903,556

Examination of Labels and Sketches, Fiscal Year 1950

Number of labels and sketches approved	29,726
Number of labels approved for imported meat	462
Number of labels and sketches refused approval	3,056
Total number of labels and sketches reviewed	33,244

Inspection of Imported Meat and Meat Food Products

Fiscal Year	Pounds
1945	92,178,607
1946	64,484,876
1947	57,832,177
1948	86,404,884
1949	254,519,299
1950	229,147,254

(2) Studies of spoilage of fresh pork sausage in storage showed that pork trimmings contributed more to the bacterial load than did plant equipment or seasoning ingredients, when so-called sterilized spices were used. Bacteriological investigations of causes of spoilage demonstrated that the rapid growth of lactic acid forming bacteria of the genus Microbacterium was the cause of the unpleasant acid flavor developedin suasage during refrigerator storage.

(3) Approximately 700 laboratory examinations were made for diagnosis of disease conditions and abnormalities in food animals and for determination of spoilage and adulteration of meat and meat food products.

(4) A condition occurring in bovine livers in Southwestern States that had been designated "yellow parenchymatous degeneration" was determined to be carotenosis. Biochemical analysis showed some but not all of the carotenosis livers contained, in addition to excess carotene, toxin amounts of vitamin A. This finding justified the exclusion of this product from human consumption.

(5) Reinvestigation of the problem of mushy hams has shown that certain types of such hams are due to bacterial contamination of the product as well as by sarcosporidiosis.

(6) Over 1,000 half-pound samples of ready-to-eat pork products processed under Federal meat inspection were examined to determine the effectiveness of processing procedures. No live trichinae were found in any of the samples and only small numbers of dead trichinae in a few. The evidence shows that processing is adequate to protect the public from the danger of trichinosis.

(7) Further studies on the survival of trichinae in pork showed that trichinae were destroyed more rapidly in salted ground pork than in salted chopped pork. In ground pork to which 3-1/3 pounds of salt were added per 100 pounds of meat, only 9 percent of the trichinae were alive after 25 day's storage, whereas in chopped pork similarly salted and stored, 18 percent of the trichinae were still alive.

(8) From time to time the carcasses of choice cattle are condemned because of sarcosporidiosis, which is an infection of the muscles with organisms known as sarcocysts. In order to determine means of dealing with this problem studies have been undertaken to determine the nature of the organism. During the past year, muscle tissues from cattle, sheep and hogs were studied microscopically and found to contain, along with debris, thread-like, club-shaped bodies resembling fungi.

(b) Eradication of Foot-and-Mouth Disease and Other Contagious Diseases of Animals and Poultry

Appropriation Act, 1951	- -
Budget Estimate, 1952	$32,700,000
Increase (apparent increase only; represents funds required to repay Commodity Credit Corporation for transfers and expenses incurred in the fiscal year 1950. Repayments have been made for previous fiscal years by supplemental appropriations)	+32,700,000

PROJECT STATEMENT

Project	Total Estimate and Increase
1. Cooperation with the Government of Mexico in the control and eradication of foot-and-mouth disease	$19,113,193
2. Enforcement of Mexican border quarantine	2,898,615
3. Inspection at public stockyards and in the field	256,935
4. Short-term research program on foot-and-mouth disease	302,400
5. Purchases and sales costs of Mexican canned meat and meat products	8,315,150
6. Interest	551,752
7. Inventory losses	818,339
8. Control and eradication of foreign poultry diseases .	15,000
Total	32,271,384
Transfer from "Salaries and expenses, Animal Industry, Agricultural Research Administration"	-15,000
Unobligated balance of funds transferred from Commodity Credit Corporation available in fiscal year 1951	443,616
Total estimate	32,700,000

INCREASE

An appropriation of $32,700,000 in order to repay Commodity Credit Corporation for funds transferred and expenses incurred in the fiscal year 1950 for the control and eradication of foot-and-mouth disease in Mexico

Beginning with the fiscal year 1948, annual appropriation acts for the Department have authorized the Secretary to transfer from any funds available to the Department amounts necessary to finance the eradication of foot-and-mouth disease, subject to later reimbursement. Transfers have been made from funds of the Commodity Credit Corporation for the conduct of the program. Appropriations for repayments for activities in 1948 and 1949 have been made. The increase recommended will cover repayments of expenses incurred through June 30, 1950.

The appropriation requested of $32,700,000 consists of the following:

Unreimbursed transfers from CCC:	
Fiscal year 1949	$11,596,041
Fiscal year 1950	30,478,230
1950 unobligated balance of transfers from CCC available in 1951	443,616
Total above items	42,517,887
Less estimated sale value of June 30, 1950 canned meat inventory	-9,817,887
Total estimate	32,700,000

Outlook for 1951 and 1952

Fiscal Year 1951

The present outlook is favorable for eradication of foot-and-mouth disease in Mexico. Expenditures in 1951 are expected to be less than half those of 1950.

Cooperation with the Government of Mexico in the control and eradication of foot-and-mouth disease. The termination of vaccine production in April 1950, termination of the mass vaccinations in July 1950, and the lengthening of inspections in several areas from 30- to 60-day intervals in Mexico, will result in decreased expenses in 1951. No active infection was discovered in the field in Mexico between December, 1949 and December 1950. However, an outbreak was reported on December 29, 1950 affecting a herd of 56 cattle in the State of Veracruz, about 100 miles inside the northern quarantine line separating the area of previous infection from the disease-free sections of Northern Mexico. The infected and exposed cattle were slaughtered and immediate precautions taken to avoid further spread.

Substantial areas in the northern and southern parts of the quarantined zone have entered the period during which the protection given by the vaccination is diminishing. Because of the repeated vaccinations, the duration of protection is extremely variable. Although it is not definitely known, it is probable that immunity in addition to the basic 4-month period was obtained in many individual animals. As this protection diminishes, there are increasing numbers of susceptible animals through calf crops. If there is virus remaining alive, it should manifest itself by infecting these susceptible animals. Accordingly, the greatest emphasis is now being given to careful inspection and reinspection of these animals month by month to be sure that the disease will not occur and remain undetected. This is a testing operation on a very large scale beginning with few animals in small areas but eventually including the entire cattle,

sheep, swine, and goat population of the quarantined area. It is not possible to predict how long this testing period will have to continue. The findings during the first year or two will determine future needs. There probably will be some future outbreaks of the disease, but it is believed that the present system will insure their quick discovery and prompt eradication. The greatly diminishing numbers of outbreaks encountered during the past year and a half are indicative of the soundness of the program and give confidence that the disease will be eradicated in Mexico within a reasonably short period of years.

Enforcement of Mexican border quarantine and inspections at public stockyards and in the field in the United States. The border patrol and inspections at public stockyards and in the field are being continued. Expenses of border patrol operations are slightly less in 1951 than in 1950 due to savings in use of jeep trails.

Short term research. Research on foot-and-mouth disease related to problems in Mexico is being carried on in Europe on about the same scale in 1951 as in 1950.

Purchases and sales costs of Mexican canned meat and meat products. The meat purchase program in Northern Mexico was discontinued in February 1950. All meat purchased in the fiscal year 1949, and about half of that purchased in 1950, has been disposed of. It is expected that the remainder will be disposed of in 1951. Since there will be no purchases in 1951, expenses will be limited to sales costs which consist mainly of storage and handling.

Fiscal Year 1952

The level of operations in the fiscal year 1952 in Mexico and in the United States will be entirely dependent on the disease situation there and the need for protective measures in the United States. The work in Mexico should cost substantially less than in 1951. Border patrol and inspections at public stockyards and in the field in the United States would continue at about the same level. The research program will be discontinued since further results of benefit in Mexico will probably not be available in time for use there.

Note.--As it is not possible to anticipate with any degree of accuracy the requirements of the program, the Budget Estimates propose to continue the present language authorizing the Secretary to transfer from other funds of the Department, subject to later reimbursement, the amounts necessary for the eradication of the disease. It is planned to continue to make such transfers from funds of the Commodity Credit Corporation and to request funds required to reimburse the Corporation for the costs incurred in fiscal years 1951 and 1952 in the annual Budget Estimates for fiscal years 1953 and 1954, respectively.

Current activities: Present activities include the following more important developments:

1. Quarantine lines are being maintained across Mexico at the northern and southern extremities of the affected area to prevent movement from within the quarantined area of cattle, sheep, swine, goats, fresh meat, animal products and other things that might carry the virus of foot-and-mouth disease. At each road crossing of the lines, quarantine stations are maintained with military personnel for enforcement and Commission personnel to inspect for the presence of prohibited animals or animal products and to see to the disinfection of vehicles. Where railroads cross the quarantine lines, similar quarantine enforcement posts are maintained at the nearest stations within the quarantined area. Along the quarantine lines between rail and road crossings there is a thin patrol of Mexican Army personnel as a deterrent against illegal movements. Straying animals ordinarily do not move very far and do not present a very great risk, although it is recognized that there is some danger involved. However, no practicable means have been discovered whereby straying can be stopped under conditions existing in Mexico.

   At the eastern end of the northern quarantine line in the rich Huasteca cattle fattening area about 130 miles of the line have been fenced. In the maintenance of the quarantine lines, much assistance is gained from the fact that the lines are so placed that they represent the division of traffic in normal commerce. Thus, concentration of the quarantine effort at the main highway and rail crossings has effectively held the disease from spreading across the quarantine lines. Restrictive quarantines are placed immediately on all premises where active infection is encountered to protect against spread of the infection. This quarantine is maintained until the animals have been destroyed, the premises thoroughly cleaned and disinfected, and absence of the infection proved with test animals.

   Another important quarantine activity involves the supervision of movements of animals within the quarantine area. The Commission aids in enforcement of Mexican Government regulations prohibiting the movement of animals from place to place unless they have been vaccinated and otherwise handled in accordance with the requirements of the Commission. Enforcement of this regulation has been beneficial in the effort to obtain proper vaccination of all susceptible animals.

2. Repeated inspections are being made throughout the quarantine area, including as nearly as possible all the susceptible animals (cattle, sheep, swine, and goats). It is realized that many animals are missed in these inspections, perhaps more than 20 percent of them. However, repetition of the inspections, constant watchfulness in the areas, and the employment of Spanish-speaking United States livestock inspectors have permitted quite an accurate evaluation of the existence or nonexistence of the disease.

When vaccination was under way, inspection preceded the vaccination crews. Active infection thus encountered was confirmed by Mexican and United States veterinarians and by laboratory tests. Each one was dealt with by the slaughter method. Following vaccination, inspection crews have inspected the animals at 30- to 60-day intervals. Centers of active infection thus discovered are also dealt with by slaughter.

An arrangement has been worked out whereby each inspection team is assigned a definite area. Members of the teams thus gain close acquaintance with the people of the area, and full knowledge of the numbers, classes, and location of livestock. It is believed that this arrangement has resulted in a much higher percentage of the animals being inspected, as well as in a much better relationship with the farmers and other local people. A great many reports of suspicious illnesses of animals are received from the farmers. These inspection teams are inspecting about 8,000,000 to 10,000,000 animals each month.

3. Slaughter operations were performed almost daily from October 1948 to the middle of April 1949. Several of the outbreaks were quite extensive and located near the northern quarantine line so that great apprehension was felt lest the infection break out of control and breach the quarantine line. Although the numbers slaughtered daily were small, the total was considerable and the infection had a discouraging way of reappearing in an area after it had been thought to be under control. In at least six instances in the States of Jalisco and Guanajuato, infection appeared in previously vaccinated animals. In some of these cases it was thought that the animals had been exposed before the vaccine could take effect. In other cases it appeared that the infection, first showing up among unvaccinated animals that had been moved into the area, was so strong that the protection of vaccinated animals was not sufficient to withstand the exposure.

Following completion of the first wave of vaccination early in August 1949 there was a long period during which no cases of active infection were discovered. Then on October 17, infection was reported in a herd in the State of Mexico near Mexico City. This outbreak was quite severe. Laboratory and animal inoculation tests indicated that it was caused by Type O foot-and-mouth disease virus whereas all other outbreaks in Mexico had been caused by Type A virus. Identification of the virus as Type O was confirmed by the Foot-and-Mouth Disease Research Institute at Pirbright, England. The animals were all slaughtered and buried and the premises given the most thorough cleaning and disinfection. A careful reinspection was made of all the susceptible animals within a radius of several miles of the affected premises. Similar reinspection was carried out in all the areas where there had been any contact with the infected herd. Fortunately no extension of the Type O infection from the premises was discovered.

During November and December 1949 four centers of foot-and-mouth disease infection were discovered. In the order of their occurence they were found in central Veracruz, lower Veracruz, northern Puebla, and eastern Jalisco. The infection in each case was determined to have been caused by Type A virus. Eradication of each outbreak, with disinfection and testing of premises and reinspection and revaccination in the surrounding areas was carried out as described above.

During the first six months of 1949, there were 7,329 animals that had to be slaughtered and buried because of infection with or exposure to foot-and-mouth disease. During the second six months of 1949 the number of animals slaughtered was only 695. The only animals slaughtered prior to December 1950 were 15 in January (clean-up of the infection found in eastern Jalisco in December 1949) and one animal slaughtered early in May in the same area as a precautionary measure although foot-and-mouth disease could not be identified as the cause of the animal's illness. The fact that no case of foot-and-mouth disease has been diagnosed between December 1949 and December 1950 gives a very encouraging indication that the virus of the disease is in fact being starved out.

4. Premises have been thoroughly cleaned and disinfected in each case where active infection has been found. In addition, barns where cattle and other livestock are confined and where it is known that the disease has been present at some time since the beginning of the epidemic in 1946, are systematically cleaned and disinfected. Disinfection is not being done in the case of uncovered corrals and open stables where the animals are not closely held and where it is considered that the action of the sunshine and other elements will destroy the virus. 27,508 premises were cleaned and disinfected during the fiscal year 1950.

There is an extensive system of regular cleaning and disinfection of livestock cars and trucks and other vehicles carrying animal products within the quarantined area. Also, there is a regular disinfection procedure at highway and rail junctions and airports to protect against accidental carrying of the virus from the quarantined area.

During each month about 21,000 trucks, 5,000 railroad cars, and 2,000 other cargo-carrying vehicles are cleaned and disinfected. No count is made of passenger vehicles.

5. Facilities for the manufacture of vaccine in Mexico had to be established from a very meager beginning. The first activity was the testing of vaccines imported from foreign countries. When production in Mexico got under way and it was found that the product held up well under testing, a maximum effort was made to increase the production so that shortly thereafter the field forces did not have to rely upon foreign produced vaccine. Now the production of vaccine has terminated with a total of 53,324,000 doses having been produced (represents full doses for cattle--only one-half this dosage is used for vaccinating other animals).

After the work in each unit of the vaccine production and testing laboratories was completed, the buildings and all equipment were given a most thorough cleaning and disinfection. Test animals from northern Mexico which had not been vaccinated were then placed on each premises and held until it was certain that no live virus existed there. It was important that all laboratory work with the virus terminate before the animals in and around Mexico City lost their protection from vaccination, as the laboratories did not have sufficient safeguards to prevent accidental escape of the virus.

Laboratory facilities continue in use for the testing of field samples of virus from suspected outbreaks in Mexico. Most of these samples (received at the rate of about 30 per month) are found to represent some condition other than foot-and-mouth disease. The condition most usually encountered is vesicular stomatitis which affects cattle and horses with symptoms very closely resembling foot-and-mouth disease. If on any occasion the sample should turn out to be foot-and-mouth disease infection, the most thorough cleaning and disinfecting procedures would be used immediately in the laboratories to kill the virus and prevent any spread into surrounding premises.

6. Protective measures in the United States continue to be carried out along the following lines:

(a) An extensive border patrol is maintained along the entire United States boundary to enforce the embargo upon the importation of ruminants, swine, and fresh meat from Mexico and the restrictions upon importation of products that might bring in the virus of foot-and-mouth disease. The present quarantine of the Mexican-United States border is based on Federal legislation that applies also to quarantine measures in effect at seaboard ports with respect to other countries where foot-and-mouth disease exists. As of July 1, 1950 there were 540 employees assigned to the border project. Most of the border is patrolled on a basis of two shifts of 7 hours each 7 days per week, with additional supervision given as needed at critical points. However, in a number of areas where there is good border fence or the condition of the range is such that livestock are not apt to be moving to the border, the patrol is on a one-shift basis 7 days per week. Most of the patrols are on horseback but the Bureau has constructed at various points along the border 711 miles of trail suitable for jeep travel. In those areas most of the patrol is now being done by jeep with a saving in man power because of the greater distances that can be effectively covered by jeep patrol. Cost of construction and maintenance of the jeep trails during the past year have totaled a little over $150,000. The jeep trails provide much in rapid means of communication and better opportunity for supervision of the work by the foremen and supervisors.

The entire border is divided into 39 areas with a foreman in charge of each so that there is close supervision of the work at all times. Air patrol is used to supplement the ground patrol. The use of the planes which are under contract to the Bureau has been found extremely helpful in identifying movements of livestock at or near the border so that prompt action may be taken to prevent crossing. An effective system of communicating from plane to ground patrol has been worked out.

The border patrol work is carried on in close cooperation with the Bureau of Customs and other federal agencies operating along the border. Following an arrangement made in December 1948, some 79 key members of the Bureau of Animal Industry's patrol have been designated as Customs agents, thus permitting closer working relationship and avoidance of duplication of patrol forces along the border.

(b) There are immediate investigations of suspected cases of animal diseases that simulate foot-and-mouth disease. These cases arise in all parts of the country. Since the outbreak of foot-and-mouth disease in Mexico, there have been many such cases reported. The investigations so far have, without exception, shown the condition to be something other than foot-and-mouth disease. During the fiscal year 1950 there were unusually large numbers of cases of vesicular stomatitis, a disease that very closely resembles foot-and-mouth disease in its appearance although it is far less damaging to the animals. Specially trained diagnosticians are sent to premises where this disease appears, to make sure that the condition is not foot-and-mouth disease. A good many other conditions of livestock affecting the mouths, feet and udders, are constantly occurring in all parts of the country and require immediate and careful investigation to be sure that foot-and-mouth disease has not accidentally gained entrance into the country and remained undetected. The success or failure of the eradication effort in any future outbreak of foot-and-mouth disease will probably depend upon the promptness with which the outbreak is discovered and reported and the accuracy of the diagnosis. In each of these investigations, Bureau of Animal Industry inspectors work side by side with State livestock sanitary officials who provide local quarantine enforcement. In that way, both State and Federal agencies are fully informed and their representatives present to meet any emergency.

Early in 1947 the Bureau gave special training to 12 qualified veterinarians located in various parts of the country. These men have served as special diagnosticians to investigate and conduct animal inoculation tests in cases of suspected foot-and-mouth diseases. A few months ago 14 additional men were given this type of training so that the area to be covered by each man has been very materially reduced. Each section of the country now has one of these specially trained men within easy call.

(c) State livestock sanitary officials are consulted in plan-making in order to be prepared for instant action in the event foot-and-mouth disease should be found in any part of this country.

(d) Inspections are made at public stockyards throughout the country to detect animals showing symptoms of foot-and-mouth disease in order that the existence of this disease may be quickly ascertained, if it should enter the country. Early detection of the disease would permit the taking of prompt action to prevent its spread. This is a form of insurance to minimize the possibility that a small outbreak of the disease may spread far and wide through unrestricted movement of infected and exposed animals.

7. Cooperative research liaison is maintained with foreign foot-and-mouth disease research stations. Qualified United States personnel are assigned to cooperative research in Europe as facilities are available for their work there. Three scientists are presently assigned to cooperative work at the Foot-and-Mouth Disease Research Institute on Lindholm Island, Denmark; two are working at the State Institute for Veterinary Research at Amsterdam; and a sixth scientist is studying at the Research Institute at Pirbright, England. Equipment needed for experimental work in these countries, but not available there, has been obtained in the United States for cooperative work. Studies of diagnostic procedures and of modifications of the composition and use of vaccine are under way, together with physical and chemical investigations of the causative virus.

Immune sera against foot-and-mouth disease viruses Types A, O, and C have been prepared in the cooperating European laboratories and immune sera against vesicular stomatitis types Indiana and New Jersey at the Animal Disease Station, Beltsville, Maryland. Through the use of these sera and the application of techniques studied by Bureau personnel in European laboratories, it has been possible to maintain a continuous check of the types of virus prevailing in Mexico.

Except for one outbreak of O virus, which was an unusually virulent strain, all foot-and-mouth disease in Mexico has been determined to be due to Type A virus. Among the Mexican Type A viruses, however, variants have been found. Vesicular stomatitis, particularly of the New Jersey type, but occasionally of the Indiana type, has been repeatedly diagnosed in Mexico.

Information on techniques of production of prophylactic vaccine obtained by Bureau scientists from their work in European laboratories was applied directly in the vaccine production program in Mexico. Necessary adaptations to production in Mexico were made. Scientists who studied these techniques in Europe were assigned to Mexico where their technical knowledge and experience were devoted especially to problems of vaccine production and serological identifications of prevailing types of virus.

Advantage was taken of the maintenance of laboratories in Mexico City to carry out several lines of investigation important to the project there. These have included: (a) closer determination of the duration of immunity produced by vaccines used in Mexico; (b) determination of the length of time vaccine produced in Mexico can be stored

without losing its effectiveness; (c) some determinations of the probable effects of multiple vaccination; and (d) production of virus by culture on animal tissue and preparation of sample lots of vaccine from such virus. This work was of great help to the Commission in Mexico. However, with the termination of vaccine production and testing work in Mexico it is not appropriate to conduct further research there involving the use of live virus.

8. Purchases and sales of Mexican canned meat and meat products. As a result of closing the border to imports of livestock from Mexico, northern Mexico lost its only market for a large percentage of its cattle production. Ordinarily calves and grass-fed steers had been sold by Mexican producers to feeders in the United States where they were finished for market. A serious surplus of cattle began to develop in northern Mexico. This greatly increased the danger of foot-and-mouth disease spreading first to this area and then to the United States. To ease this situation the Department, through technical assistance, aided the Mexican industry in establishing canning plants and initiated the program for purchase of canned meat in northern Mexico. This activity has been considered an essential adjunct to the program for control and eradication of foot-and-mouth disease in Mexico.

The facilities of the Production and Marketing Administration have been utilized in the purchase of canned meat and meat products. The product has been turned over to the Commodity Credit Corporation for sale, and proceeds from sales have been credited by the Corporation against funds transferred to the appropriation item "Eradication of foot-and-mouth and other contagious diseases of animals."

This program started in fiscal year 1948 and was continued in operation during fiscal years 1949 and 1950. During these three fiscal years, the Department purchased 216.5 million pounds of canned meat and meat products at a cost of 56.2 million dollars. 147.5 million pounds have been sold for 26.7 million dollars leaving an inventory as of June 30, 1950 of about 69 million pounds with an estimated sale value of $9,800,000. Including costs incurred in storage and shipment, total losses incurred under the canned meat program will be about $23,000,000.

After a careful study of the situation at the end of the fiscal year 1949, it appeared evident that it would be necessary to continue this program in 1950 in order to prevent the surplus of cattle from again reaching dangerous proportions. However, the quantity purchased during 1950 was substantially less than during 1949 since the surplus of cattle in northern Mexico had been considerably reduced by previous purchases. In addition, a substantial number of cattle from Northern Mexico were being used for the production of vaccine and it was possible during the 1950 fiscal year to export sizable quantities of frozen Mexican beef through programs of the Economic Cooperation Administration.

At the end of fiscal year 1950, it was decided to discontinue the Mexican meat purchase program under this appropriation. Further Federal purchases of canned meat appeared undesirable because of the difficulty and loss involved in disposing of it in this form. Moreover, it appeared possible to increase the exports of frozen Mexican beef to fill needs of ECA countries. Since there was a need for continued relief of the oversupply of cattle in northern Mexico, it was agreed that the Commodity Credit Corporation would assist in this operation. Currently, the Commodity Credit Corporation is purchasing frozen beef in Mexico under its foreign purchase program but only to fill firm requisitions or orders received from ECA or other claimants and only at prices which will fully reimburse the Corporation. The only cost to this appropriation will be approximately $75,000 in 1951 for inspection, grading, supervision of processing, consultation with processing plants, etc.

Importation of canned and cooked meats into U. S. A. Mexico recently established a meat inspection system recognized by this Department, effective December 30, 1950, as substantially equivalent to the meat inspection service in the U. S. A. Accordingly, Mexican canned and cooked meats and meat food products may now be imported into the United States. Present restrictions that prohibit entry of fresh, chilled, or frozen meats will continue in effect as long as foot-and-mouth disease exists in Mexico. Imported meat products also must pass rigid import meat inspection conducted by the Federal Meat Inspection Service of the United States Department of Agriculture, at the time they are offered for importation, before they are accepted in domestic commerce.

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH ADMINISTRATION
BUREAU OF ANIMAL INDUSTRY

CONTROL AND ERADICATION OF FOOT-AND-MOUTH DISEASE
Obligations and Funds Provided as of November 30, 1950

Obligations	F. Y. 1947	F. Y. 1948	F. Y. 1949	F. Y. 1950	F. Y. 1951 (as of November 30, 1950)	Total
Control and eradication activities:						
Payments made to the Mexican-United States Commission for the Eradication of Foot-and-Mouth Disease in Mexico	$9,000,000	$22,000,000	$10,030,000	$11,080,000	$1,730,000	$53,840,000
Direct Federal expenses for program in Mexico	1,152,451	5,803,470	7,229,940	8,033,193	2,584,226	24,803,280
Enforcement of Mexican border quarantine	255,146	1,952,415	2,850,000	2,898,615	1,079,564	9,035,740
Inspection at public stockyards and in the field to detect immediately any possible introduction of foot-and-mouth disease into the United States ..	3,188	116,661	166,000	256,935	140,379	683,163
Short-term research on foot-and-mouth disease	- -	94,920	258,000	302,400	99,872	755,192
Total	$10,410,785	$29,967,466	$20,533,940	$22,571,143	$5,634,041	$89,117,375
Meat purchase program in northern Mexico:						
Purchase of canned meat and meat products in northern Mexico ...	- -	11,300,240	37,620,418	7,252,851	- -	56,173,509
Administrative expenses incident to meat purchases	- -	74,424	202,381	116,070	29,600	422,475
Handling charges (canned meat)..	- -	424,742	1,607,137	946,229	300,000	3,278,108
Total	- -	11,799,406	39,429,936	8,315,150	329,600	59,874,092

(Continued on next page)

Obligations	F. Y. 1947	F. Y. 1948	F. Y. 1949	F. Y. 1950	F. Y. 1951 (as of November 30, 1950)	Total
Interest on funds borrowed from CCC	- -	211,398	349,888	551,752	227,000	1,340,038
TOTAL OBLIGATIONS	10,410,785	41,987,270	60,313,764	31,438,045	6,190,641	150,331,505
Deduct: Application of gross receipts from sales of canned meat and from inspection fees a/	- -	-12,010,804	-13,837,640	-959,815	-5,260,000	-32,068,259 a/
NET TOTAL OBLIGATIONS (NET OF RECEIPTS FROM SALE OF MEAT) ...	10,410,785	29,967,466	46,476,124	30,478,230	930,641	118,263,246
Funds Provided						
By CCC:						
Gross transfers of funds	- -	36,975,000	63,200,000	24,460,000	6,517,000	131,152,000
Interest costs on funds transferred; and handling charges, canned meat	- -	636,140	1,957,025	1,497,981	527,000	4,618,146
Total	- -	37,611,140	65,157,025	25,957,981	7,044,000	135,770,146
1948 transfers available in 1949	- -	-200,336	+200,336	- -	- -	xxx
1949 transfers available in 1950	- -	- -	-5,923,680	+5,923,680	- -	xxx
1950 transfers available in 1951	- -	- -	- -	-443,616	+443,616	xxx
Net total	- -	37,410,804	59,433,681	31,438,045	7,487,616	135,770,146

a/ Gross receipts are reflected herein as applications in the fiscal year in which the sales contracts are executed. Receipts on a cash basis, by fiscal years, are as follows:

Fiscal year 1948 -	$9,773,428
Fiscal year 1949 -	9,016,682
Fiscal year 1950 -	8,018,149
Fiscal year 1951 -	5,260,000
Total	$32,068,259

(Continued on next page)

Obligations	F. Y. 1947	F. Y. 1948	F. Y. 1949	F. Y. 1950	F. Y. 1951 (as of November 30, 1950	Total
Less:						
Application of gross receipts from sales of canned meat and from inspection fees	--	-12,010,804	-13,837,640	-959,815	-5,260,000	-32,068,259
Repayments of funds transferred from appropriations therefor...	--	-25,400,000	-34,000,000	--	--	-59,400,000
Unreimbursed transfers	--	--	11,596,041	30,478,230	2,227,616	44,301,887
By Appropriations	10,805,000	30,500,000	34,000,000	--	--	75,305,000
Net Total Funds Provided	10,805,000	30,500,000	45,596,041	30,478,230	2,227,616	119,606,887
Unobligated Balances:						
Not available in subsequent year— transferred to Treasury	-46,666	--	--	--	--	-46,666
Available in subsequent year ...	-347,549	-880,083	--	--	--	xxx
Prior year balance available ...	--	+347,549	+880,083	--	--	xxx
Available as of date of report..	--	--	--	--	-1,296,975	-1,296,975
Totals	-394,215	-532,534	+880,083	--	-1,296,975	-1,343,641
NET TOTAL OBLIGATIONS (AS ABOVE)..	10,410,785	29,967,466	46,476,124	30,478,230	930,641	118,263,246

MEXICAN-UNITED STATES COMMISSION FOR THE ERADICATION
OF FOOT-AND-MOUTH DISEASE

Statement of Commission Receipts, Disbursements, and Available Cash 1/

Cumulative to November 30, 1950

Cash and Disbursements

		Pesos	Pesos
Cash:			
In Banks		$4,681,583	
In hands of United States paymasters and other employees		2,398,135	7,079,718
Disbursements:			
Indemnities:			
Cattle	126,017,876		
Small animals	13,010,880 2/	139,028,756	
Expenses of Commission		275,077,120	414,105,876
Total			421,185,594

Funds Made Available to the Commission

Payments to the Commission:		
By the United States	346,462,593 3/	
By Mexico	44,945,714 2/	391,408,307

Funds Made Available to the Commission — Continued

Receipts:		
Vaccine testing and miscellaneous	27,029,607	
Slaughter program (salvage of animals, return of indemnities on delivery of mules, etc.)	2,747,680 4/	29,777,287
Total		421,185,594

1/ Because of variations in the rate of exchange, this statement is made in pesos.

2/ Includes indemnities in amount of 7,515,813 pesos, paid by Mexican Government prior to October 3, 1947, which are now considered a contribution by the Mexican Government.

3/ $53,840,000 (converted at varying rates—$31,000,000 while rate was stabilized at 4.85 pesos to the dollar; $9,589,947 while rate fluctuated from 6.88 to 8.46; $13,250,053 at present stabilized rate of approximately 8.64).

4/ The joint commission conducted salvage operations between October 3, and December 13, 1947, when salvage operations ceased. Salvage operations for that period included 5,025 cattle and 278 small animals. Prior to October 3, 1947, the Mexican Government conducted salvage operations.

Eradication of Outbreak of Asiatic-Type Newcastle Disease of California

A small outbreak of Asiatic Newcastle disease of poultry was eradicated in California in the fiscal year 1950 by slaughter of the infected and exposed birds, followed by cleaning and disinfection of the premises and then testing the thoroughness of the work with known susceptible birds. Although there is a form of Newcastle disease that is widespread in the United States, this is the first recorded case of disease in this country caused by the Asiatic strain of the virus, which appears to produce a more severe disease with high mortality rate.

On March 18, 1950 an air shipment of pheasants, quail, ducks, and partridges arrived at San Francisco from Hong Kong, China. Several birds were dead on arrival. The remaining birds were taken to the importer's premises a short distance from San Francisco. During the period from March 18, to April 3 birds from the importer's premises were shipped to four other premises in California and during the same period a few birds from the importer's premises, although not of the importation, were sent to one point in Montana, one in Arizona, two in Wisconsin, and one in Pennsylvania. Meanwhile several additional imported birds and a number of bantam chickens on the importer's premises died. The owner brought this situation to the attention of the Veterinary Department of the University of California on April 1. Three birds brought to the laboratory were examined without significant findings.

On April 3 and 4 additional examinations were made in the laboratory and on the importer's premises and the findings indicated possibility of a disease unknown in the United States, diagnostic tests were begun. The Bureau inspector in charge in Sacramento and the California State authorities telephoned the Washington office of the Bureau April 4. During the succeeding two days the closest liaison was maintained between the two offices in an effort to arrive at a diagnosis. Quarantine orders were placed on the five premises in California. On the morning of April 7 the Bureau received word that in the opinion of qualified experts studying the disease the condition was judged to be a severe poultry disease of foreign origin probably either fowl pest or Asiatic Newcastle disease. (Later conclusion was that the disease was Asiatic Newcastle disease.) On the same day the Department and the California authorities issued orders authorizing cooperative measures to eradicate the disease. Although the birds that had been shipped to other States were placed under quarantine and given repeated inspections for a period of three weeks, no evidence of disease was discovered among them.

Slaughter of the birds was begun on April 8 and completed April 12. Following that the premises were thoroughly cleaned and disinfected, held free of any birds for 30 days and then stocked with a number of known susceptible birds which were observed frequently to determine whether they developed symptoms of the disease. This procedure was necessary to learn whether the eradication procedures had been effective. Since there was no evidence of recurrence of the disease it was formally determined by the Department, on July 25, 1950, to have been eradicated. The cost of the eradication of this outbreak of Asiatic Newcastle disease was $30,000, half of which was borne by the Department, and was transferred under the authority of this appropriation, from the appropriation "Salaries and Expenses, Bureau of Animal Industry". The other half is to be paid by the State of California. Nearly $27,000 of the amount was for indemnities for birds.

At the time of the outbreak of this disease, the Department had under consideration regulations governing the inspection and quarantine of birds of this kind offered for importation into the United States. Such regulations became effective June 18, 1950. It is anticipated that there will be considerable activity in connection with the enforcement of these new regulations. Although the volume of importations is small, the birds usually come in small lots from various parts of the world, involving many importers. This work is being handled in conjunction with the inspection and quarantine of livestock offered for importation, which activity has long been under the jurisdiction of the Department.

CHANGES IN LANGUAGE

The estimates include proposed changes in the language of this item as follows (new language underscored; deleted matter enclosed in brackets):

Eradication of foot-and-mouth and other contagious diseases of animals and poultry: For expenses necessary in the arrest and eradication of foot-and-mouth disease, rinderpest, contagious pleuropneumonia, or other contagious or infectious diseases of animals, or European fowl pest and similar diseases in poultry ***** pursuant to the pro-
1 visions of the Act of February 28, 1947 [(21 U.S.C. Supp. II, 114b-114d),] and the Act of May 29, 1884, as amended (7 U.S.C., 391; 21 U.S.C., 111-122), including expenses in accordance with section 2 of said Act of February 28, 1947, the Secretary may transfer from other appropriations or funds available to the bureaus, corporations, or agencies of the Department such sums as he may deem necessary, to be available only in an emergency which threatens the livestock or poultry industry of the country, ***** Provided further, That poultry may be appraised in groups when the basis for appraisal is the same for each bird.

2 To enable the Secretary to make repayment to the Commodity Credit Corporation for amounts transferred and expenses incurred under this head during the fiscal year 1950, pursuant to authority granted in the Department of Agriculture Appropriation Act, 1950, $32,700,000.

The first change in language is for the sole purpose of eliminating a citation which is included in the subsequent reference to 21 U.S.C., 111-122.

The second change in language is for the purpose of appropriating $32,700,000 to reimburse the Commodity Credit Corporation for funds advanced and expenses incurred through June 30, 1950, for the control and eradication of foot-and-mouth disease.

STATUS OF PROGRAM

Control and Eradication of Foot-and-Mouth Disease

History and development: The existence of foot-and-mouth disease in Mexico was confirmed December 26, 1946. Legislation authorizing the Secretary of Agriculture to cooperate with the Government of Mexico to eradicate, suppress, or control the outbreak was approved February 28, 1947 (21 U.S.C. 114b-c-d). The Mexican-United States Commission for the Eradication of Foot-and-Mouth Disease was established through an exchange of diplomatic notes between the two governments on March 17 and 18, 1947. The first appropriation ($9,000,000) for cooperative work with Mexico was approved March 27, 1947. Commission offices were established in Mexico City on April 10, 1947.

The original plan of eradication included the slaughter and burial of infected and exposed animals, the maintenance of quarantines, and disinfection operations— practically the same methods that had been used with success during outbreaks in the United States. Some modifications were necessary to meet Mexican conditions and customs. For instance, since oxen are the chief draft animals in Mexico and since large numbers of them are affected with the disease, it became necessary to establish a program of replacing slaughtered oxen with mules. This was to enable food production on Mexican farms to continue. The plan of eradication provided for the payment of indemnities, based on fair appraised value, for all cattle, swine, sheep, and goats destroyed. Mexican and United States veterinarians, technicians, appraisers, and paymasters generally worked in pairs under the direction of the Joint Commission. The Mexican National Army has aided the campaign by providing protective services and quarantine enforcement.

Slaughtering operations were going forward at the rate of about 50,000 animals a week in November 1947 yet the spread of the disease to new areas showed that local quarantine restrictions were not being enforced. A strong sentiment was developing among the Mexican people and their officials for a change to a less drastic program. An appraisal at that time indicated that a continuation of the plan, without modification, to eradicate the disease from Mexico might mean the destruction of between 4,500,000 and 5,000,000 cattle and a similar number of swine, sheep, and goats. Mexican officials presented their conclusion to the Commission that the country could not stand the economic shock of this wholesale destruction of animals.

After detailed study of the program, the Joint Commission agreed to a modified program, effective November 26, 1947. The principal features of the revised program as agreed upon at that time included:

(1) strengthening quarantine enforcement, particularly the lines at the northern and southern boundaries of the main infected areas;

(2) conducting extensive inspections to determine whether infection exists;

(3) prompt disposal, by slaughter, of infected and directly exposed animals in centers of active infection located in the work areas;

(4) cleaning and disinfection of premises, trucks, cars, and other things that had been exposed to the disease and might harbor the virus; and

(5) vaccination of healthy susceptible animals to build up their resistance to the disease.

The plan provided for vaccine production in Mexico as well as purchase of vaccines in foreign countries.

The Department undertook to continue to furnish a market outlet for cattle in northern Mexico in the form of canned meat, as a precautionary measure to prevent spread of foot-and-mouth disease to northern Mexico and the United States. This program was initiated following recommendations by the Department Industry Advisory Committee on Foot-and-Mouth Disease and by members of the subcommittees on Foot-and-Mouth disease of both Houses of Congress who visited Mexico

Thorough inspections repeated several times throughout the areas adjacent to quarantine lines were effective in holding back movements of animals toward the lines from the infected area and showed that a very considerable zone immediately within the quarantine lines could safely be removed from the quarantine restrictions. This was done in five stages--the last being on January 14, 1949, when 4,900 square miles were removed from the quarantined area, making a total of about 43,000 square miles that have been released from quarantine. On November 3, 1948, it was necessary to restore the quarantine to about 600 square miles near the western end of the northern quarantine line as a precautionary measure because of the discovery of an area of active infection dangerously near the line.

Centers of infection near the northern quarantine line in the States of Zacatecas, Aguascalientes, San Luis Potosi, and the Huasteca area of northern Veracruz, were eradicated by the slaughter method and the premises cleaned and disinfected. Although the number of animals involved and the spread of the infection in each case were limited, the success of those activities in the face of considerable resistance to any slaughter was an encouraging indication of the effectiveness of the organization and the measures used. In southern Veracruz, near the quarantine line at the lower extremity of the infected area, a "buffer" area was cleaned of infected and exposed animals and an outbreak in the State of Tabasco beyond the lower quarantine line was eradicated, all by the slaughter method.

Vaccine production progress: Following the change in program, immediate attempts were made to obtain suitable vaccine from countries maintaining production facilities. It was necessary to obtain vaccine made from Type A virus, and, as quickly as possible, the Mexican variant of type A virus was supplied the producing countries for use in the production of vaccine for Mexico. Supplies of vaccines were limited and the problems of shipping and maintaining controlled refrigeration of the product while in transit seriously hampered the application of this phase of the program. It was also necessary that all vaccines, before use in the field, be tested for innocuity to make certain that the product was safe for use, and tested for potency to be sure the product was reasonably effective when used under conditions existing in Mexico. Vaccinations were begun in selected areas which were most in need of reinforcement. 1,644,619 doses of vaccine were purchased from Argentina, The Netherlands, Switzerland, and Denmark.

In order to produce vaccine in Mexico it was necessary first to establish facilities. This was expedited by sending equipment and supplies and trained personnel from the United States. The first vaccine actually produced in Mexico was in May 1948. By the end of June 1948 three lots of vaccine, comprising 45,000 doses, had been produced and facilities developed for production of increasing amounts in succeeding months.

The work of vaccine production and testing was greatly speeded up so that within a few months the Commission was able to supply its entire needs. It was possible to produce over 5,000,000 doses in one month when necessary. Very rigid laboratory tests of the vaccine produced in Mexico indicated that the Commission vaccine was of excellent quality. The total amount of vaccine produced in Mexico was 53,324,000 doses. Vaccine production was terminated in April 1950.

Inspection and vaccination program: The work of inspection and vaccination moved steadily southward on a solid front from the northern quarantine line and northward from the southern quarantine line, covering all the susceptible animals encountered. The probable duration of resistance to the disease imparted by the vaccine was thought to be 6 months. However, it was found that the protection given could not be relied upon for more than 4 months. Accordingly, the period between vaccinations was reduced from 6 months to 4 months, thus adding about one-third to the vaccination requirements to maintain a reasonably high degree of immunity for an extended period of time. Active infection encountered in this work was dealt with by slaughter, and infected premises cleaned and disinfected. Constant reinspections of the animals in and near the work areas before and after vaccinations provided information upon the effectiveness of the methods used and insured against spreading of the disease behind the lines.

Most of the susceptible animals in the quarantined zone were vaccinated four times; the remainder were vaccinated three times. Mass vaccination was completed by July 31, 1950 with only a small amount of "clean-up" vaccination since that time. Cumulative vaccination figures during the program as of November 30, 1950, were:

First vaccination	13,420,802
Second vaccination	14,552,597
Third vaccination	17,184,824
Fourth vaccination	14,844,205
Special vaccination (near outbreak, etc.)	127,761
Total	60,130,189

(c) Research Facilities

The Second Deficiency Appropriation Act of 1949 provided $500,000 for preparing plans and specifications, and for acquiring an option on a site for laboratory facilities for research on foot-and-mouth disease, and placed an over-all limitation of $500,000 on this project.

Prudence Island in Narragansett Bay, Rhode Island, was selected by the Secretary as a site and tentative plans and estimates of costs were prepared by the General Services Administration. An estimate in the amount of $24,500,000 to acquire a site, complete plans and specifications, and construct facilities was submitted to Congress (H. Doc. 640, 81st Congress) but the request was denied. The House Committee stated the following in its report:

> "House Document No. 640 includes an estimate of $24,500,000 to construct a research laboratory on Prudence Island, Rhode Island, for the purpose of studying the foot-and-mouth and similar animal diseases. The committee feels that the Department should explore further the possibility of conducting this work in cooperation with those countries which have existing research facilities and are presently engaged in this work. Consequently, it does not approve this estimate at this time."

Expenses under the $500,000 appropriation were $44,302. The unobligated balance of $455,698 has been placed in budget reserve.

The Bureau has again explored the possibility of expanding research on foot-and-mouth disease in existing laboratories. Presently the only possibility of expansion in Europe is in Denmark, on a limited scale, but there is no definite assurance that this will materialize. Facilities in Brazil would permit assignment of a small staff for work in that country provided professional personnel could be recruited for work there.

The Budget estimates for 1952 make no provision for research work on foot-and-mouth disease, except as such research may be found necessary or desirable due to developments which cannot now be foreseen in connection with the eradication program in Mexico.

STATEMENT OF OBLIGATIONS UNDER ALLOTMENTS, WORKING FUND, AND TRUST FUNDS

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Research and Marketing Act of 1946, (Title II), Department of Agriculture (Bureau of Animal Industry):			
Marketing research and service	$26,159	$25,000	$25,000
Working Fund, Agriculture, Agricultural Research Administration:			
Advanced from Office of the Surgeon General, Department of the Army:			
For a study of data in Western Europe pertaining to the nutritional status of the population during and immediately after the last war	20,913	--	--
Advanced from Atomic Energy Commission:			
For research on the metabolism of the embryo and the effect of internal radiations	--	30,680	--
Total, Working Fund, Agriculture, Agricultural Research Administration	20,913	30,680	--
Expenses and Refunds, Inspection and Certification of Canned Wet Animal Foods (Bureau of Animal Industry) (Trust Fund):			
For inspection and certification of canned wet animal foods upon application of an interested party, which service is financed by fees which are covered into the Treasury as a special trust fund and are appropriated and made available for the payment of expenses and refunds in connection with the work provided for under cooperative agreements	91,035	94,706	100,000
TOTAL, OBLIGATIONS UNDER ALLOTMENTS, WORKING AND TRUST FUNDS	138,107	150,386	125,000

PASSENGER MOTOR VEHICLES

It is anticipated that 85 cars will be replaced, constituting slightly less than 10 percent of the total number of cars now owned and operated under the above appropriations. The 856 Bureau passenger-carrying vehicles in operation in the United States and Mexico are the minimum number necessary to adequately perform the work of the Bureau at the current level. Approximately 90 per cent of the cars are used in inspectional work on farms in rural districts, and many of them have mileage of 18,000 and upward a year. All the cars to be replaced have reached the point where they can no longer be economically kept in service. The average mileage of those to be replaced in the fiscal year 1952 will have speedometer readings exceeding 60,000 miles or will have been in service 6 years or more.

BUREAU OF DAIRY INDUSTRY

Purpose Statement

The Bureau of Dairy Industry was established July 1, 1924, pursuant to Act of May 29, 1924. Its activities comprise four broad areas of research, as described below, and enforcement of regulations governing the manufacture of process butter.

1. Breeding, feeding, and management of dairy cattle and the interrelationship of conformation, internal anatomy, and mammary development to producing capacity.

2. Determination of the effect of nutrition on growth, health, reproduction and lactation, and the physiological processes affecting the usefulness of dairy cattle, including the vitamin requirements of calves, methods of evaluating forages, effects of renovation and rotations on pasture production, effect of feeding thyroprotein to producing cows, relation of nutrition to sterility, and the usefulness of grass silage in the ration of growing heifers.

3. Compilation and analysis of genealogical and production data on approximately 1,000,000 cows in 40,000 dairy herd improvement association herds to evaluate the genetic make-up of individual animals, particularly sires, in order that the hereditary influence of sires possessing an inheritance for high producing capacity may be disseminated to the general dairy cow population.

4. Determination of the chemical and physical properties of dairy products; the effect of variations in processing and handling; the physiology and taxonomy of the bacteria of importance in dairy products manufacture; and development of new and improved methods of manufacturing milk products and byproducts.

The Bureau of Dairy Industry conducts research in Washington, at six field stations, and at fourteen State Agricultural Experiment Stations. The staff employed on November 30, 1950 numbered 307, of whom 167 were stationed in the field.

	Estimated, 1951	Budget estimate, 1952
Appropriated funds	$1,589,500	$1,589,000

Salaries and Expenses

Appropriation Act, 1951	$1,617,500
Reduction pursuant to Section 1214	-27,500
Activities transferred in the 1952 estimates to "Salaries and expenses, Office of Information" for distribution of motion pictures	-500
Base for 1952	1,589,500
Budget Estimate, 1952	1,589,000
Decrease (due to providing a direct appropriation to the General Services Administration for certain procurement costs previously paid from this appropriation)	-500

PROJECT STATEMENT

Project	1950	1951 (estimated)	Decrease (GSA adjustment)	1952 (estimated)
1. Dairy cattle breeding, feeding, and management	$601,847	$589,675	$-125	$589,550
2. Nutrition and physiology	377,704	368,475	-125	368,350
3. Dairy herd improvement investigations	307,284	308,575	-125	308,450
4. Dairy products research	308,790	302,375	-125	302,250
5. Administration and enforcement of the Process Butter Act	24,162	20,400	- -	20,400
Unobligated balance	2,792	- -	- -	- -
Total available	1,622,579	1,589,500	-500	1,589,000
Transfers in 1951 estimates from:				
"Research and Marketing Act of 1946, Department of Agriculture"	-467,087	- -		
"Special research fund, Department of Agriculture"	-45,418	- -		
Transfer in 1952 estimates to "Salaries and expenses, Office of Information, Department of Agriculture"	+426	+500		
Reduction pursuant to sec. 1214	- -	+27,500		
Total appropriation or estimate	1,110,500	1,617,500		

CHANGE IN LANGUAGE

The estimates include a proposed change in language as follows (deleted matter enclosed in brackets):

> For necessary expenses in carrying out the provisions of the Act of May 29, 1924 (7 U.S.C. 401-404), including investigations, experiments, and demonstrations in dairy industry, [for carrying out] the applicable provisions of the Act of May 9, 1902 * * *

This change in language is proposed for the sole purpose of simplifying and shortening the wording of the item.

STATUS OF PROGRAM

Current Activities: The Bureau conducts specialized research pertaining to dairy cattle, milk, and milk products. It cooperates with State and other Federal agencies, and with individuals and organizations in the dairy industry, including processors of milk and milk products. Major phases of the research program include:

1. Research in dairy cattle genetics, including investigations to determine the relative usefulness of various systems of breeding in improving milking, reproductive, and disease resistant qualities; feeding and management studies; anatomical studies to determine relationships between physical characteristics and milking ability; growth and development studies based on body weight and skeletal measurements; and methods of selecting profitable producers at an early age. Physiological reactions of dairy animals to extreme temperatures are also being determined to aid in improving dairy cattle in the Southern sections by breeding.

2. Research in dairy cattle nutrition and physiology to develop methods leading to the economical production of milk. Such research includes the evaluation of feeds and feeding regimes, the nutritional requirements of cattle, feeding procedures and other factors affecting the milk producing capacity of dairy cows, and of the nutritional value of milk as well as the relation of the nutrition of the cow to the nutritive qualities of the milk produced.

3. Research in the basic principles of sanitary milk production and handling to preserve the palatability and nutritive and sanitary qualities of milk and to improve the quality and reduce the cost of manufacture of dairy products; to develop the domestic manufacture of dairy products; and to increase the utilization of milk products and byproducts in foods.

The Bureau also demonstrates at regional dairy experiment stations the dairy practices applicable to such regions, and conducts a National Dairy Herd Improvement Program in cooperation with the State extension services to improve the producing efficiency of dairy cows by applying the results of research in dairy cattle breeding, feeding, and management. The average production of the million cows in Dairy Herd Improvement Association herds is approximately double the average production of all cows in the national dairy herd. Among the projects now being conducted, the following are selected as typical:

1. Evaluation of outbreeding, inbreeding of various intensities, proved sire breeding, and crossbreeding in improving the milk producing qualities of dairy cattle.

2. Determinations of the reactions of dairy animals to heat stress and causes of severe declines in milk production.

3. Experiments to conserve grain through a more extensive use of grass silage in rearing heifers and for milk production.

4. Studies of the fundamental causes of sterility in dairy cattle.

5. The effect of feeding thyroprotein on milk production, reproduction and length of the productive life of dairy cows.

6. To determine the cause for and to develop means of preventing the development of the common defects in body, color, and flavor in stored condensed and evaporated milks.

7. Development of methods of processing and determination of the conditions of handling and storing normal and concentrated milks in liquid or frozen condition.

8. Development of methods for the manufacture of foreign-type cheeses, i.e., Swiss, Roquefort, brick, and Italian types, especially from pasteurized milk.

9. Development of new forms of and new uses for milk byproducts in ice cream, sherbets, and bakery products.

Selected Examples of Recent Progress:

1. Preliminary experiments on the mechanics of heat regulation in dairy cattle indicate that the immediate cause of lowered milk production under heat conditions is reduced feed intake. Work now in progress is designed to find reasons for this reduced feed consumption and to develop information useful in the selection and breeding of heat resistant dairy animals.

2. When reared under identical conditions, the growth rate of Red Sindhi-Jersey crosses has been about 10 percent greater than that of purebred Jerseys even though the average weight of the Red Sindhi is somewhat less than that of the Jersey.

3. Penicillin was found to be approximately 10 percent more effective than streptomycin or preparations containing both penicillin and streptomycin in eliminating mastitis producing organisms from the udders of cows in the Bureau of Dairy Industry herd.

4. The butterfat test of Holstein cows in the Beltsville herd was increased by using sires transmitting high test factors. Without culling low testing females, but with controlled environmental conditions, the test has been increased from 3.5 percent to approximately 3.9 percent.

5.

5. Heifers raised on rations supplying only 70 percent of the accepted standards of total digestible nutrients, and subsequently put on full feed after calving, are producing satisfactorily. This would suggest that heifers can be reared

satisfactorily at a lower feed cost than is possible through the use of generally recommended feeding standards.

6. In an attempt to assess possible long-time deleterious effects induced by feeding thyroprotein to dairy cattle to stimulate milk production, periodic electrocardiograms were obtained. Evidences of heart abnormalities were not constant and do not appear to affect the general health of cattle fed thyroprotein.

7. Wilted alfalfa silage is equal in feeding value to alfalfa hay for dairy heifers up to 8 months of age if supplemented with from 500-550 pounds of grain. If the grain ration is reduced to 400 pounds or less, growing heifers do not grow as well on alfalfa silage as on alfalfa hay, which indicates the importance of maintaining adequate grain feeding and energy consumption for growing heifers particularly where the main roughage is in the form of alfalfa silage.

8. A quantitative method based on measurements of the epiphyseal cartilage as shown on X-ray pictures has been developed for assay of vitamin D in calves, making possible a more accurate appraisal of the antirachitic properties of various forages and the vitamin D requirements of calves.

9. Crushing hay as it is cut shortens the field curing period and increases the carotene and protein content, and does not cause greater nutrient losses.

10. The use of sulphur dioxide did not decrease top spoilage in the silo, but treatments throughout the silo while filling produced silage with a considerably higher carotene content than untreated silage. Alfalfa hay treated with sulphur dioxide during barn drying was preserved with 5 percent more dry matter and about 20 percent more carotene than untreated hay. These results indicate that nutrient losses during harvesting of forage crops may be reduced by the use of this material. Sulphur dioxide treatment is not proposed, however, as a substitute for good field curing practices.

11. Fuller knowledge of the nutritional value of feeds is limited by the difficult procedures used in determining digestibility. Simplified procedures have been developed for the determination of digestibility which are less time consuming and costly and which give comparable results to standard techniques.

12. 4,335 sires were proved in dairy herd improvement associations in 1949. Their daughters produced an average of 9,761 pounds of milk and 397 pounds of butterfat as compared to 9,607 and 391 pounds of milk and butterfat, respectively, in 1948. 27.9% of all sires proved during 1949 had daughters whose average butterfat production exceeded 425 pounds.

13. 2,104 sires were used in artificial breeding associations, of which 36.1% had 5 or more daughters with DHIA production records. The daughters produced an average of 436 pounds of butterfat.

14. Lipases cause the development of rancidity in milk products and also in fats and oils. This enzyme must be destroyed by heat, but studies of such destruction are dependent upon quantitative methods for estimating the lipase content. A colorimetric method has now been developed which will detect 1 pound of raw milk in 2,500 pounds of heated milk.

15. Lactose causes sandiness in ice cream. A lactase enzyme overcomes this sandiness by reducing the lactose. This permits the use in ice cream mixes of larger quantities of milk-solids-not-fat, which are in large supply. A procedure has been developed to measure the lactase enzyme activity.

16. Sweet cream buttermilk will improve the flavor and texture of ice cream as well as the apparent richness of the product. Buttermilk can be prepared, stored and utilized in a sweetened condensed form.

17. Whey in liquid or dried form when used in sweet bakery goods prolongs the shelf life of cakes, cookies, etc., and produces a tender cakelike texture. The greater utilization in bakery goods and other foods would aid in solving the serious problem of whey disposal.

18. Whey proteins may be processed with the use of enzymes to form a product suitable for use in the manufacture of spreads and other food products, thereby avoiding waste of the material.

19. If antibiotics are used to treat mastitic cows, the milk from at least 3 to 4 milkings following treatment should be discarded. The antibiotic action of such milk inhibits the bacterial action required in the manufacture of cheese.

20. The phosphatase test for determining the adequacy of pasteurization of milk used in manufacturing dairy products has been improved and adapted for use in determining whether alfalfa hay was field or artificially dried. Since there is an inverse relationship between the carotene and phosphatase content when these methods are used, the test can be used as an indication of the feeding value of hays with respect to their vitamin A content.

Receipts from Sales of Dairy Products and Animals
(Deposited in Miscellaneous Receipts of the Treasury)

Fiscal Year	Receipts
1946	$141,451
1947	157,802
1948	149,082
1949	128,328
1950	109,913

STATEMENT OF OBLIGATIONS UNDER ALLOTMENTS

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Research and Marketing Act of 1946 (Title II), Department of Agriculture (Bureau of Dairy Industry):			
Marketing research and services	$24,818	$52,000	$25,000

BUREAU OF AGRICULTURAL AND INDUSTRIAL CHEMISTRY

Purpose Statement

The Bureau of Agricultural and Industrial Chemistry as now constituted was established in 1943, continuing research work conducted for many years by predecessor organizations. A Bureau of Chemistry existed in 1901 and the Congress had appropriated funds for chemical analyses of agricultural products as early as 1848.

The Bureau conducts investigations and experiments in the fields of chemistry and related physical sciences, technology, and chemical engineering on problems related to the conservation and industrial utilization of agricultural commodities, residues, and byproducts in foods, feeds, drugs, and nonedible products.

Four regional research laboratories, one in each of the major farm producing areas, provide facilities for investigations to develop new and expanded industrial and food uses for the principal farm commodities of their respective regions:

Southern Laboratory New Orleans, Louisiana	Cotton, peanuts and other oil seeds, and sweetpotatoes.
Western Laboratory Albany, California	Fruits, vegetables, poultry products, alfalfa, and wheat.
Eastern Laboratory Wyndmoor, Pennsylvania	Apples and other fruits, potatoes and other vegetables, tobacco, milk products, animal skins, hides and tanning materials, animal fats and oils.
Northern Laboratory Peoria, Illinois	Corn, wheat, and other cereals, such as oats, rye and barley, soybeans and other oilseeds, and agricultural residues.

This decentralized operation also facilitates contact with food processors and other industry groups. In 10 smaller field stations of the Bureau applied research is being directed toward the problems of processing and utilizing the products and byproducts of pine gum, tung nuts, sugar plants, citrus and other fruits, and vegetables. Fundamental research is conducted on the nature and control of enzyme action, on the toxic and other physiological effects of substances that might be considered for medicinal uses or that contaminate or exist in foods and feeds, and on substances that exhibit special biological activity in or toward plants.

Employment as of November 30, 1950, was 1,427, of which 64 were in the headquarters office in Washington, and the balance in the field.

	Estimated, 1951	Budget estimate, 1952
Appropriated funds	$7,970,000	$7,967,000

Salaries and Expenses

Appropriation Act, 1951	$7,960,000
Reduction pursuant to Section 1214	-130,000
Activities transferred in the 1952 estimates from "National Institutes of Health, Public Health Service, Federal Security Agency" for cortisone investigations	+140,000
Base for 1952	7,970,000
Budget Estimate, 1952	7,967,000
Decrease (due to providing a direct appropriation to the General Services Administration for certain procurement costs previously paid from this appropriation)	-3,000

PROJECT STATEMENT

Project	1950	1951 (estimated)	Decrease (GSA adjustment)	1952 (estimated)
1. Cereal and forage crops utilization investigations	$1,283,242	$1,339,168	-$507	$1,338,661
2. Cotton and other fiber crops utilization investigations	1,299,230	1,225,213	-486	1,224,727
3. Fruit and vegetable utilization investigations ..	2,221,187	2,125,463	-795	2,124,668
4. Oilseed utilization investigations	1,184,155	1,151,014	-429	1,150,585
5. Sugar and special plants utilization investigations (including pine gum, tobacco, tanning materials, wild plants, etc.)	753,348	781,404	-291	781,113
6. Poultry, dairy and animal products utilization investigations	1,186,579	1,086,310	-399	1,085,911
7. Agricultural residues utilization investigations.	291,069	261,428	-93	261,335
Unobligated balance	94,764	- -	- -	- -
Total available	8,313,574	7,970,000	-3,000	7,967,000
Transfers in 1951 estimates from:				
"Research and Marketing Act, Department of Agriculture"	-2,563,971	- -		
"Special research fund, Department of Agriculture"	-54,378	- -		
Transfer in 1952 estimates from "National Institutes of Health, Public Health Service, Federal Security Agency"	- -	-140,000		
Reduction pursuant to Section 1214	- -	+130,000		
Total appropriation or estimate	5,695,225	7,960,000		

CHANGE IN LANGUAGE

The estimates include a proposed change in the language of this item as follows (deleted matter enclosed in brackets):

> For expenses necessary for investigations * * * [$7,960,000: Provided, That not to exceed $20,000 shall be available for the alteration to buildings of the Naval Stores Station at Olustee, Florida] * * *

The change in language is proposed to delete the non-recurring authority provided in the 1951 Appropriation Act for alterations to buildings at the Naval Stores Station at Olustee, Florida. The construction will be completed during the Fiscal Year 1951, and retention of the provision is no longer necessary.

STATUS OF PROGRAM

General: Research is being conducted in four Regional Research Laboratories and 10 smaller field laboratories to increase the outlet for farm commodities, their derived products and byproducts, through food and nonfood uses. The investigations include the development of new and improved processes that will make possible the production of more stable, more nutritious, and more attractive foods, and of materials for which there are present or potential demands for the production of nonfood items. Interest in the expansion of current outlets and the development of new outlets for agricultural commodities is stimulated by commercial evaluation of new processes and new products in cooperation with industry. The Bureau cooperates with Agricultural Experiment Stations, farm cooperative groups, and industrial concerns in determining problems to be undertaken.

Specific Examples of Problems to Which Efforts Are Now Being Directed Are:

1. Processing and Utilization of Starch - Many new and improved uses for starch would be possible if starch could be made up and handled in aqueous pastes of greater concentration. Factors controlling the interaction of starch and water are being determined from measurements of the water sorptive capacity of corn and other cereal starches. Since 98 per cent of the three to four billion pounds of starch produced annually in this country is processed with water, and 33 per cent of all starch is ultimately used as a solution in water, greater progress in research on the processing and utilization of cornstarch should result from this study.

2. Milling Character of Wheat Determined by Laboratory Tests - The intrinsic differences between good- and poor-milling wheats are largely unknown. With suitable correlations between chemical composition and milling properties once established, development of laboratory tests for predicting milling properties could reasonably be expected; such tests would be particularly useful in the early evaluation of new wheat varieties. With Rex wheat, a notoriously poor-milling variety, exploratory work has indicated that a relatively high fat content contributes to its poor milling behavior.

3. Preservation of Carotene in Alfalfa - Alfalfa, when properly dehydrated, is an excellent source of pro-vitamin or carotene for mixed feeds. However, this vitamin is largely lost during storage. Last year results were reported on the discovery of several chemicals capable of markedly reducing the rate of loss of carotene. The toxicity of these compounds is being determined at the Colorado State Experiment Station with support from an industry association. A study of their large scale application is in progress at the dehydration plant of a large farm cooperative.

4. Extensive tests to discover better ways of protecting cotton fabrics from rot and mildew will be made cooperatively by the Bureau and the Army Quartermaster Corps. The tests are expected to provide the most reliable data ever collected on the effectiveness of the various fungicidal treatments for cotton.

5. Chemically modified cotton fabrics having been found useful in the purification of air, water, or solutions of agricultural products, such as sugar starch and vegetable proteins, research is being conducted to adapt cotton in this form for use as substitutes for ion-exchange resins of which there are over 8 million pounds used annually in purification processes.

6. Scouring Grease Wool - Basic investigations of the suint salts which are naturally present in grease wool have led to a method of scouring that makes use of the soaplike nature of these salts. Laboratory studies indicate that the wool would be subjected to a milder treatment than in the standard soap-soda process, and that the wool grease would be easily recoverable, thus minimizing a serious stream pollution problem. The method is being further studied from the standpoint of practical process development.

7. Development of New Methods of Food Preservation Through Antibiotics - The extended heating time at elevated temperature required in canning foods to insure sterilization adversely affects the flavor of many products. If antibiotics could be successfully used in the sterilization process, radical changes in present processing methods might be possible, with accompanying improvement in product quality. Antibiotics, including subtilin, discovered in a Bureau laboratory, are now being studied by the Bureau and by industrial laboratories for possible use in such a process.

8. Development of low cost methods of dehydrating potatoes to reduce them to stable form is an important problem in the utilization of surplus potatoes. One of the cheapest methods of accomplishing this is natural freeze-dehydration of potatoes, which has been successfully applied in North Dakota where the potatoes are spread over the ground in the fall and are dehydrated sufficiently during the winter and spring by alternate freezing and thawing to make them suitable for livestock feed. The Bureau is investigating the possibility of utilizing this method of dehydration in various sections of the country, such as Maine, New York, and other areas where climatic conditions would appear to be suitable for application of the method.

9. Frozen Apple Juice Concentrate - Commercial procedures for the production of full-flavored frozen apple juice concentrate are being investigated in cooperation with the Washington State Apple Commission, apple growers' organizations, and the Bureau of Agricultural Economics. Bureau facilities and Bureau-developed processes are being used to produce sufficient quantities of several types of the concentrate for consumer preference studies and marketing tests.

10. Sulfur Compounds in Citrus Juice - The occurrence of sulfur-containing compounds in orange juice was discovered, and the compounds were isolated and identified because such substances generally have a marked effect on odors and flavors. The changes in these compounds during the processing and storage of citrus juices are being studied in order to determine what relation they may have to the off-flavors that develop in some processed juices.

11. Control of rancidity in potato chips is an important problem of the potato chip industry and its solution would be a great stimulus to this rapidly expanding outlet for potatoes. A careful study is being made of the various factors that might affect the keeping quality of potato chips, such as the type of oil used to prepare the chips, use of antioxidants, use of mixtures of fats that resist rancidity well, and the effect of light, temperature and humidity during storage. Chips represent the only food use for potatoes that is expanding; currently some 20 million bushels of potatoes are used annually for this purpose.

12. Refining Losses of Soybean Oil - When tank cars of crude soybean oil are shipped from processor to refiner, sludge frequently accumulates in the bottom of the car. The price of the oil is adjusted according to refining loss as measured on a sample taken when the car is loaded, but if the amount of sludge deposited exceeds 150 pounds per tank car (about 61,000 pounds of oil) an additional adjustment in price is made. The relationship between refining loss and sludge is being determined because it affects both the price of the oil and the good will between buyer and seller. There is a decrease in refining loss as sludge is deposited and preliminary tests indicate that present penalties on sludge and refining loss may need adjustment to be fair to both buyer and seller.

13. Improved methods for removing the coloring matter in crude cottonseed oils are needed to improve the competitive position of this oil for use in edible oil products, particularly shortening. The amount of color and the difficulty of removing it varies with the area of production and season of growth. When the cotton crop is short, as in 1950, the need for better processing methods is greater. Bureau research is seeking a solution in work on the refining and bleaching steps of oil processing and on the nature of the pigments in the oil.

14. Soy Flour - Uniformity in quality and characteristics of top-grade soy flour is essential before its acceptance by the baking industry can be expected. Samples of commercially available soy flours are being collected to determine their uniformity and and their baking characteristics. Already a survey has been made of full-fat soy flours, results showing that a lack of uniformity exists. A similar survey is now being made of defatted

soy flours. These investigations are considered necessary as a basis for developing methods for the successful use of soy flour in bread and pastries.

15. An improved method of making peroxides from turpentine offers a promising means for expanding the outlets of naval stores products in the chemical industry. Cooperative tests by the Office of Rubber Reserve of the Reconstruction Finance Corporation are being made to determine whether peroxides from turpentine can replace those from benzene in the production of cold rubber. The supply of benzene, now short, would become critical in a national emergency. It is estimated that 500,000 gallons of turpentine would be consumed if turpentine peroxides were used to produce the 760,000 tons of synthetic rubber scheduled for 1951.

16. Technologic research is underway in the Bureau to develop new and improved equipment and processing technics for making maple sirup, so as to lower manufacturing costs, increase flavor retention, and produce a uniform high quality sirup. Maple sap concentration is a complex operation, and it is important to avoid destruction of the maple flavor, or its overconcentration in the product.

17. Synthetic elastomers derived from lactic acid offer considerable promise (as specialty rubbers) for increased outlets for milk sugar and other fermentable carbohydrates. A butyl acrylate copolymer, one of the latest of these elastomers to be prepared by the Bureau, shows excellent resistance to oils and to extremes of low and high temperature. These properties are of great importance both for civilian and military use. Investigations are underway to develop satisfactory formulations for preparing the finished rubber product, which information is essential before commercial development can be undertaken.

18. Low-grade animal fats and greases, are potentially valuable intermediates in the preparation of plastics, plasticizers, lubricants, lubricant additives, waxes, surface active agents, waterproofing agents and many other products. The Bureau is investigating the utilization of an important group of such derivatives called the vinyl esters of long-chain fatty acids. These substances can be converted by suitable procedures developed by the Bureau into products with a wide range of usefulness, such as for films, sheets, coating materials, adhesives, and rubber-like substances; and specific uses for these products are being explored.

19. Effects of Chemicals on Storage Life of Shell Eggs - The chemistry of shell eggs deterioration is not understood although a number of factors such as temperature, humidity and oiling of the shell are known to influence the rate of deterioration. Gaseous chemicals such as hydrogen sulfide and sulfur dioxide have been found to penetrate the shell and to cause changes that simulate natural deterioration. Continuing studies con-

cern the practical significance of these findings in egg storage and their fundamental significance as a lead in the search for understanding of the mechanism of deterioration.

20. The Bureau has developed satisfactory methods of preparing dry honey-skim milk mixtures which are promising as outlets for honey and skim milk in the baking industry. Development of satisfactory formulas for dry food mixes containing this honey-milk product for use by commercial bakeries is essential to its commercialization, and investigations are being initiated to solve this problem.

21. The conversion of furfural, a chemical derived mainly from corncobs, to useful new products offers a promising means for developing expanded outlets for agricultural residues. Hydrogenation of the reaction products of furfural with acetone gives clear, sirupy liquids. These new compounds are being tested for possible use in plasticizers and hydraulic brake fluids, and for making resins useful in paints and varnishes.

Selected Examples of Recent Progress:

1. Further clinical studies in metropolitan hospitals have dramatically confirmed the life-saving effectiveness of starch sponge as a hemostatic agent. This evidence has spurred three of the major drug companies to initiate active programs of exhaustive clinical tests of both block and powdered starch sponge for the commercial production of this new surgical agent for controlling hemorrhage that may utilize 1,000,000 pounds of starch annually.

2. A practical process for synthesizing a potential therapeutic (glucuronic acid) from dextrose has been perfected. This acid has long been known to be a compound of considerable physiological significance because of its ability to remove a number of toxic materials from the human body. It is being clinically evaluated.

3. A new streptomycin has been produced by fermentation of agricultural materials from a newly discovered microorganism, designated Streptomyces griseo-carneus. The new streptomycin has been isolated in pure form and found to differ from ordinary streptomycin by one oxygen. It has been named "hydroxystreptomycin," and is now being tested on animals to determine toxicity and possible therapeutic usefulness.

4. Corn sugar, fat, and sulfuric acid, after chemical conversion and combination, have been made into a superior synthetic detergent and wetting agent. Laboratory tests bear out the practical soil-removing value of the product. If the large-scale production of these superior cleansing agents proves to be economically practicable, additional outlets will be developed for considerable quantities of two important agricultural commodities - vegetable fats and cornstarch.

5. To increase the sale of cotton cloth for use where wind and water resistance are important factors, the Bureau developed a new attachment for a standard loom which weaves tighter, denser cotton fabrics. During the past year, this attachment has been improved so that it is now suitable for continuous commercial use in textile mills.

6. New machine aids cotton processing. Four machinery companies and three textile mills have made definite plans to build cotton opening machines designed by the Southern Regional Research Laboratory. About 50 other textile mills have asked for information about the new machine since it was announced on September 4, 1950. The machine, which rapidly opens and fluffs baled cotton to make it clean easier and spin better, meets a long recognized need of the textile industry. It may prove of special value in preparing mechanically harvested cotton for cleaning and processing into yarns and fabrics.

7. Soil-resistant treatment of cotton clothes: A new treatment which makes cotton clothes more resistant to soiling and easier to launder was developed under a research contract. The process consists of simply adding a small amount of a commercial compound, carboxymethyl cellulose, to the final rinse water each time cotton goods are washed. This method is being evaluated in commercial laundries.

8. Improved Navel Orange Products: Navel oranges have never been satisfactorily processed because the juice usually turns bitter after extraction. For this reason the Navel orange grower receives little return for the ten to twenty percent of his crop unsuited for the fresh market. Studies conducted over several seasons have suggested two possible methods for destroying or removing this bitterness from processed products. One method employs the adsorption of the bitter principle or its precursor on activated charcoals, while the other makes use of a commercial fungal enzyme or an enzyme complex obtained from tomatoes to bring about changes in the bitter principle.

9. Improvements in Tomato Paste Manufacture: Studies of tomato paste processing methods demonstrated that unless the pectic enzymes normally present in tomatoes are inactivated by heating within seconds after pulping of the fruit there is serious loss of pectic substances. When this occurs the desired paste consistency can be obtained only by further concentration. This information has been brought to the attention of the industry, and the processing equipment in some plants is being altered correspondingly.

10. Production of Vitamin B_{12}: A strain of Bacillus megatherium has been found to produce high yields of vitamin B_{12} when grown in aerated vats on a medium of sugar from fruit wastes, ammonia and inorganic salts. The dried harvested cells contain 7 mg. of vitamin B_{12} per pound and are rich in protein as well

as other vitamins of the B complex. Several companies are using the process on a semi-pilot plant scale to produce a vitamin B_{12}-rich feed supplement.

11. Recovery of Sugar from Pear Peels and Cores: Evaluation tests of pears canned during the 1949 season in a sirup made from pear peels and cores by a process developed jointly by the Bureau and a farm cooperative were so encouraging that the cooperative, with Bureau assistance, packed more than 1400 cases in that manner during the 1950 season. With the permission of the food regulatory agencies the juice-canned pack is being used for a preliminary market test.

12. Conversion of pear waste unsuitable for preparation as a food product to feed and other non-food products was successfully tested on a pilot-plant scale in cooperation with an association of canners. Evaluation of the dried fruit pomace and molasses by the California Agricultural Experiment Station showed that these products are highly palatable to stock, and small-animal tests by the Bureau's Pharmacology Laboratory have not disclosed any toxic reactions from spray residues. The Bureau is cooperating with the canners' association in making plans for a semi-commercial operation.

13. The Bureau has developed improved methods that are now being used by industry to determine the gossypol content in cottonseed products. Gossypol content is important because it adversely affects nutritional quality. The new techniques not only help in establishing equity between buyer and seller, but they help the processor to produce meal of more uniform nutritional value.

14. Color Grading of Vegetable Oils - The value of a vegetable oil depends to a great extent on its color; therefore, color grading is an important factor in trading in vegetable oils. In cooperation with industrial laboratories, a method has been developed for grading the color of these oils. The new method eliminates the personal errors of the old method, and gives much more reproducible results.

15. The Bureau has demonstrated that edible cottonseed oil is free from the potent allergen found in the cottonseed. This finding controverts the long-standing belief that allergens of cottonseed and other oilseeds cannot be eliminated completely from edible oils derived by extraction and refining. People who are allergic to the oilseed allergens need not exclude the edible vegetable oils from their diets. Thus, so far as allergenicity is concerned, factory consumers of edible oils and fats are permitted unrestricted freedom in selection of edible oils to suit the changing conditions of markets and consumer preferences.

16. The Bureau devised a process for producing maple sirup of greatly intensified flavor, which is already in use by at least three commercial processors of maple products. This process offers a means of preparing low-cost, full-flavored sirup blends of high quality and should provide a greatly expanded market for maple sirup.

17. In cooperation with the Production and Marketing Administration, the Bureau has developed a simple color comparator fitted with permanent glass standards for color grading of maple sirup. This inexpensive instrument is used in place of the caramel-glycerine solutions which have been used for grading maple sirup. Since the color of the caramel-glycerine solutions is not stable, these color standards have not been very satisfactory; and the permanent glass standards are rapidly coming into general use.

18. A method has been developed for removing the strong off-flavors from low-grade honey, leaving it with the characteristic floral flavor.

19. Methods of molding cast candies in mixtures of calcium carbonate and starch developed in cooperation with the National Confectioners' Association promise to eliminate explosion hazards attendant upon use of dried starch alone in candymaking and may result in savings on insurance rates on candy plants. The mixtures also provide a more versatile molding medium for improving quality of cast candies.

20. In cooperation with the Sugar Research Foundation the Bureau has developed methods of preparation and applications for allyl-sucrose which indicate considerable promise for commercial development. One indicated important use is for modifying natural drying or semi-drying oils.

21. A process has been developed that appears to have real possibilities (now being explored) as an economic procedure for reducing stream pollution due to dairy waste. Conditions have been found under which bacteria can be made to convert almost all of the protein and carbohydrate of dairy plant effluents to water and carbon dioxide before discharge of such effluents into streams.

22. Calcined Feathers for Fertilizer: Conversion of waste feathers from poultry packing plants into a dry meal by cooking with steam under pressure for a short time has now been applied on a small commercial scale. Feather meal was found to be readily salable as a component of mixed fertilizers, since its nitrogen becomes slowly, but almost completely, available in the soil and the feather meal tends to prevent the undesirable caking of other fertilizer components. At current prices and costs the operation will be profitable.

23. Greatly Improved Powdered Whole Egg: During the last war powdered whole egg was an excellent food product as freshly made, but was unacceptable after shipment to combat areas. Recent results show that a simple process produces a very stable dried egg powder. The small amount of glucose normally present was shown to induce rapid deterioration in flavor and baking function when egg powder is stored at moderately elevated temperatures. This deterioration is prevented by removing the glucose from the egg prior to drying, which can be accomplished by a relatively simple resting-cell yeast fermentation process. A commercial scale run has been carried out successfully.

24. A Greatly Improved Dried Egg White. A process has been developed for the removal of sugar from egg white by controlled bacterial fermentation. This product, when dried, yields on a laboratory scale, dried egg white which is superior to that now produced commercially. Practical scale evaluation of the process is underway.

25. Improved corrugated strawboard for use in packaging now excels board made from pulpwood, in stiffness. This improvement in quality was accomplished cooperatively with strawboard companies principally by the development of modified cooking procedures and other methods to yield better grade pulps.

26. A new and potentially large use for corncob grits has been developed by the Bureau in low-pressure blasting to clean electric motors, motor generators, and similar equipment, supplanting a solvent process which was time-consuming, costly, and hazardous. A large manufacturer is now marketing an air-blasting unit designed specifically for using soft grits produced from agricultural residues.

STATEMENT OF OBLIGATIONS UNDER ALLOTMENTS AND TRUST FUNDS

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Research on Strategic and Critical Agricultural Materials, Department of Agriculture (Bureau of Agricultural and Industrial Chemistry):			
Research on domestic production of natural rubber	$106,729	$110,000	$109,800
Investigations of domestic production of vegetable tannins.	- -	50,000	125,000
Investigations on vegetable oils	9,137	- -	182,300
Total	115,866	160,000	417,100
Miscellaneous Contributed Funds, Department of Agriculture (Bureau of Agricultural and Industrial Chemistry) (Trust Account):			
Research on citrus products: Arizona and California research on citrus products; freezing preservation of food products	1,652	39	- -
Synthetic Liquid Fuels, Bureau of Mines, Department of the Interior (Transfer to Agriculture) (Bureau of Agricultural and Industrial Chemistry):			
Operation of semi-works plant for studies of production of liquid motor fuels from agricultural products	73,619	- -	- -
TOTAL OBLIGATIONS UNDER ALLOTMENTS AND TRUST FUNDS	191,137	160,039	417,100

BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

Purpose Statement

The Bureau of Plant Industry was established under provisions of the Agricultural Appropriation Act of 1902, approved March 2, 1901, and the Act of June 3, 1902 (5 U.S.C. 524). In February, 1943, the name was changed to the Bureau of Plant Industry, Soils, and Agricultural Engineering.

Research is organized in four major groups, as follows:

1. Field Crops: Research is concerned chiefly with the production and improvement of cereals, cotton, forage, rubber, sugar, tobacco and other important food, feed, fiber, oil and specialty crops. Increased yield, improved quality, and resistance to diseases, insects, heat, drought, cold, or other hazards is sought by breeding, selecting, and testing varieties and by improving crop management practices. Methods of controlling weeds are also studied.

2. Horticultural Crops: Research is conducted on the production and improvement of fruit, vegetable, nut, and ornamental crops, and on methods of reducing losses from diseases and deterioration involved in handling, processing, transporting, and storing these crops. Methods are developed for avoiding or controlling diseases of trees and forest products. Foreign plant explorations and introductions provide new crops and valuable breeding material for the development of improved crops. Investigations are also conducted on reducing crop damage caused by nematodes and on the control of plant disease epidemics.

3. Soils: Soil investigations are directed toward the determination of systems of soil management and irrigation that will increase soil fertility and give most efficient crop production; the improvement of fertilizers and liming materials; and the classification and mapping of soils with particular respect to their crop production capacities, crop adaptations and management practices. The relation of soils to plant, animal, and human nutrition are also studied.

4. Agricultural Engineering: Agricultural engineering investigations are concerned with the improvement of farm machinery for planting, cultivating, fertilizing, spraying, dusting, and harvesting crops; the development of improved equipment and facilities for processing and storing farm products; the design of improved farm buildings and houses; and the development and application of electrical equipment to farm use.

The Bureau also is responsible for the operation, maintenance, and development of the National Arboretum, which was established by Congress in 1927 in the District of Columbia to provide a collection of living plants from this country and abroad valuable not only for breeding with native species to develop improved strains of trees, shrubs, and flowers for parks, boulevards, and other landscape uses, but also for study by students and scientists.

The research work consists primarily of field, laboratory, and greenhouse experiments conducted usually in cooperation with state agricultural experiment stations, industry and others. Because of the diverse crops and wide range of soil and climatic conditions, it is necessary to conduct the work at numerous field locations. Research results are made available to farmers and others through increase and distribution of improved varieties, and by dissemination of information through the Federal-State cooperative extension service, publications, the agricultural press, and correspondence.

Work Locations and Personnel: The Headquarters of the Bureau are at Plant Industry Station, Beltsville, Maryland. In the field, the work is conducted at approximately 200 locations in 45 States, at Summit, Canal Zone, and at Sao Paulo, Brazil. As of November 30, 1950, under all funds of the Bureau there were 2,172 full-time employees, including 119 in the Departmental Service, and 705 part-time employees. In addition there were 691 collaborators serving without compensation.

	Estimated, 1951	Budget estimate, 1952
Appropriated funds	$10,844,000	$10,785,000

BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

Summary of Appropriations, 1951 and Estimates, 1952

Item	Total estimated available, 1951 a/	Budget estimates, 1952	Increase (+) or Decrease (-)
1. Plant, soil, and agricultural engineering research	b/$10,695,350	$10,636,400	$-58,950
2. National Arboretum	148,650	148,600	-50
Total, direct annual appropriation	10,844,000	10,785,000	-59,000

a/ Adjusted for comparability with the appropriation structure proposed in the 1952 Budget Estimates.

b/ Includes $100,000 provided in Supplemental Appropriation Act, 1951, for liquidation of a contract authorization provided in the 1950 Agricultural Appropriation Act to construct or acquire buildings, facilities, and equipment for the new Southwest Irrigation Field Station, Brawley, California.

Proposed Consolidation of Subappropriation Items

The Budget Estimates propose the consolidation of five subappropriation items into a new single subappropriation item "Plant, soil, and agricultural engineering research," and the retention of the sixth without change as follows:

Present	Proposed
1. Field crops 2. Fruit, vegetable, and specialty crops 3. Forest diseases 4. Soils, fertilizers, and irrigation 5. Agricultural engineering	Plant, soil, and agricultural engineering research
6. National Arboretum	National Arboretum

This consolidation is proposed for the sole purpose of simplifying the appropriation structure and administration of the Bureau, and will in no way affect the nature or scope of the research work authorized and conducted. Work previously performed under the five subappropriations which are consolidated is now represented without change by the five respective projects or activities under "Plant, soil, and agricultural engineering research."

The following table compares the existing appropriation and project structure for these items with that proposed in the 1952 Budget Estimates:

PROPOSED CONSOLIDATION OF APPROPRIATION ITEMS OR REVISION OF ACTIVITY SCHEDULES

Salaries and Expenses, Bureau of Plant Industry, Soils, and Agricultural Engineering
(Based on amounts appropriated for 1951)

Present Structure		Proposed Structure					
		Appropriation Item	Financial Project				
Appropriation Items or Financial Projects	Total Amount	Plant, Soil & Agric. Engr. Res.	Field Crops Invest.	Horticultural Crop Investigations	Forest Disease Invest.	Soils, Fertilizers & Irrig. Inv.	Agricultural Engineering Investigations
FIELD CROPS	3,437,500	3,437,500					
Cereal production, breeding, disease and quality investigations	899,750		899,750				
Cotton and other fiber plant production, breeding, disease and quality investigations	632,960		632,960				
Forage crop production, breeding, disease, and quality investigations .	777,890		777,890				
Rubber production, breeding, and disease investigations	38,770		38,770				
Sugar-plant production, breeding, disease, and quality investigations .	530,110		530,110				
Tobacco production, breeding, disease and quality investigations	245,410		245,410				
Drug, oil, insecticides, tannin, flavoring and special product plant investigations	102,790		102,790				

(Continued on next page)

Present Structure		Proposed Structure					
		Appropriation Item	Financial Project				
Appropriation Items or Financial Projects	Total Amount	Plant, Soil & Agric. Engr. Res.	Field Crops Invest.	Horticultural Crop Investigations	Forest Disease Invest.	Soils, Fertilizers & Irrig. Inv.	Agricultural Engineering Investigations
FIELD CROPS (Cont'd)							
Hop production, breeding, disease and quality investigations	28,930		28,930				
Weed control investigations	180,890		180,890				
FRUIT, VEGETABLE, AND SPECIALTY CROPS	3,012,500	3,012,500					
Deciduous fruit investigations	484,210			484,210			
Citrus, avocado, and other sub-tropical fruit investigations	164,230			164,230			
Nut investigations	287,100			287,100			
Vegetable investigations	638,220			638,220			
Potato investigations	184,870			184,870			
Plants for landscaping and ornamental purposes and farm windbreaks, Investigations of	253,690			253,690			
Methods of handling, transportation, and storage, and market diseases of fruits and vegetables, Investigations of	410,980			410,980			

(Continued on next page)

Present Structure		Proposed Structure					
		Appropriation Item	Financial Project				
Appropriation Items or Financial Projects	Total Amount	Plant, Soil & Agric. Engr. Res.	Field Crops Invest.	Horticultural Crop Investigations	Forest Disease Invest.	Soils, Fertilizers & Irrig. Inv.	Agricultural Engineering Investigations
FRUIT, VEGETABLE, AND SPECIALTY CROPS (Cont'd)							
Plant introduction, testing, and maintenance of basic stocks	358,150			358,150			
Investigations to reduce crop damage caused by nematodes.....	124,430			124,430			
Basic studies of plant growth and development.	75,700			75,700			
Investigations and control of plant disease epidemics	30,920			30,920			
FOREST DISEASES.....	452,500	452,500					
Diseases of forest and shade trees and forest products	452,500				452,500		
SOILS, FERTILIZERS, AND IRRIGATION	2,823,750	2,823,750					
Soil improvement, management and irrigation investigations	1,176,320					1,176,320	
Fertilizers and their improvement	232,070					232,070	

(Continued on next page)

Present Structure		Proposed Structure						
Appropriation Items or Financial Projects	Total Amount	Appropriation Item	Financial Project					
		Plant, Soil & Agric. Engr. Res.	Field Crops Invest.	Horticultural Crop Investigations	Forest Disease Invest.	Soils, Fertilizers & Irrig. Inv.	Agricultural Engineering Investigations
SOILS, FERTILIZERS, AND IRRIGATION (Cont'd)							
Soil classification for crop production	1,081,960					1,081,960	
Investigations of the relations of soils to plant, animal, and human nutrition	133,400					133,400	
Construction or acquisition of buildings, facilities, and equipment at new Southwest Irrigation Field Station Brawley, California ...	200,000					200,000	
AGRICULTURAL ENGINEERING .	1,130,000	1,130,000					
Farm machinery	374,340						374,340
Farm structures and related investigations ...	252,420						252,420
Mechanical processing of farm products	276,180						276,180
Farm electrification investigations	227,060						227,060
Subtotal, above items for which revisions are proposed	10,856,250	10,856,250	3,437,500	3,012,500	452,500	2,823,750	1,130,000

(Continued on next page)

Present Structure		Proposed Structure					
Appropriation Items or Financial Projects	Total Amount	Appropriation Item	Financial Project				
		Plant, Soil & Agric. Engr. Res.	Field Crops Invest.	Horticultural Crop Investigations	Forest Disease Invest.	Soils Fertilizers & Irrig. Inv.	Agricultural Engineering Investigations
NATIONAL ARBORETUM	152,700						
Operation and maintenance	104,700						
Development of physical facilities	48,000						
Total appropriation	11,008,950						

Salaries and Expenses

	Plant, Soil, and Agricultural Engineering Research	National Arboretum	Total
Appropriation Act, 1951 (Adjusted - see proposed structure, page 228)	$10,756,250	$152,700	$10,908,950
Supplemental appropriation for 1951 (Supplemental Appropriation Act, 1951)	100,000	- -	100,000
Reduction pursuant to Section 1214.	-220,250	-4,050	-224,300
Activities transferred in 1952 Estimates from "Operating expenses, National Institutes of Health, Public Health Service" for research into utilization of plant material and vegetable sources of cortisone pursuant to the General Appropriation Act, 1951	60,000	- -	60,000
Activities transferred in 1952 Estimates to "Salaries and expenses, Office of Information, Department of Agriculture" for distribution of motion pictures	-650	- -	-650
Base for 1952	10,695,350	148,650	10,844,000
Budget Estimate, 1952	10,636,400	148,600	10,785,000
Decrease	-58,950	-50	-59,000

SUMMARY OF INCREASES AND DECREASES, 1952

Plant, Soil, and Agricultural Engineering Research:	
To develop wheat varieties resistant to new races of stem rust	$+28,900
To develop practical methods for controlling oak wilt	+35,000
For operation of research program at Brawley, California ..	+85,000
Elimination of non-recurring items of $85,000 provided in 1950 Appropriation Act and $100,000 provided in Supplemental Appropriation Act, 1951, for completion of construction of buildings and facilities at the Brawley, California, field station	-185,000
Decrease due to providing a direct appropriation to the General Services Administration for certain procurement and leasing costs previously paid from this subappropriation	-22,850
Subtotal	-58,950
National Arboretum:	
Decrease due to providing a direct appropriation to General Services Administration for certain procurement costs previously paid from this subappropriation	-50

PROJECT STATEMENT

Project	1950	1951 (estimated)	Increase or decrease: GSA Adjustment	Increase or decrease: Other	1952 (estimated)
1. Plant, soil, and agricultural engineering research:					
a. Field crop investigations	$3,456,503	$3,383,790	-$5,590	+$63,900 (1)	$3,442,100
(1) Cereal production, breeding, disease and quality investigations	(891,805)	(890,380)	(-720)	(+28,900) (a) (+5,000) (b)	(923,560)
(2) Cotton and other fiber plant production, breeding, disease, and quality investigations ...	(598,256)	(619,910)	(-980)	—	(618,930)
(3) Forage crop production, breeding, disease and quality investigations..	(758,748)	(760,970)	(-610)	(+15,000) (b)	(775,360)
(4) Rubber production, breeding, and disease investigations ...	(38,671)	(37,920)	(-30)	—	(37,890)
(5) Sugar-plant production, breeding disease and quality investigations	(531,360)	(518,660)	(-2,810)	(+15,000) (b)	(530,850)
(6) Tobacco production, breeding, disease and quality investigations	(244,603)	(250,110)	(-200)	—	(249,910)
(7) Drug, oil, insecticides, tannin, flavoring, and special product plants	(98,161)	(100,600)	(-80)	—	(100,520)
(8) Hop production, breeding, disease and quality investigations...	(28,616)	(28,310)	(-20)	—	(28,290)
(9) Weed control investigations..	(181,283)	(176,930)	(-140)	—	(176,790)

(Continued on next page)

Project	1950	1951 (estimated)	Increase or decrease: GSA Adjustment	Increase or decrease: Other	1952 (estimated)
(10) Construction of an office and laboratory building at the Southwest Great Plains Field Station, Woodward, Okla.	(85,000)	—	—	—	—
b. Horticultural crop investigations	3,006,535	3,010,810	-2,410	+25,000 (2)	3,033,400
(1) Deciduous fruit investigations	(487,888)	(474,190)	(-390)	—	(473,800)
(2) Citrus, avacado and other subtropical fruit investigations	(163,728)	(160,790)	(-130)	(+7,000)	(167,660)
(3) Nut investigations	(290,864)	(281,130)	(-230)	—	(280,900)
(4) Vegetable investigations	(630,888)	(624,860)	(-510)	(+18,000)	(642,350)
(5) Potato investigations	(183,865)	(181,020)	(-140)	—	(180,880)
(6) Plants for landscaping and ornamental purposes and farm windbreaks, Investigations of	(234,426)	(248,960)	(-200)	—	(248,760)
(7) Methods of handling transportation and storage, and market diseases of fruits and vegetables, Investigations of	(431,518)	(402,350)	(-330)	—	(402,020)
(8) Plant introduction, testing and maintenance of basic stocks	(394,904)	(411,350)	(-300)	—	(411,050)
(9) Investigations to reduce crop damage caused by nematodes	(124,720)	(121,810)	(-100)	—	(121,710)
(10) Basic studies of plant growth and development	(77,410)	(74,090)	(-60)	—	(74,030)
(11) Investigations and control of plant disease epidemics	(31,324)	(30,260)	(-20)	—	(30,240)

(Continued on next page)

Project	1950	1951 (estimated)	Increase or decrease: GSA Adjustment	Increase or decrease: Other	1952 (estimated)
c. Forest diseases:					
(1) Diseases of forest and shade trees and forest products	449,277	441,970	-370	+35,000 (3)	476,600
d. Soils, fertilizers and irrigation investigations	a/2,593,429	a/2,746,900	-7,600	-160,000 (4)	2,579,300
(1) Soil improvement, management and irrigation investigations ..	(1,176,830)	(1,144,340)	(-930)	(+25,000)	(1,168,410)
(2) Fertilizers and their improvement	(236,210)	(226,220)	(-180)	—	(226,040)
(3) Soil classification for crop production	(1,047,373)	(1,058,870)	(-6,390)	—	(1,052,480)
(4) Investigations of the relation of soils to plant, animal, and human nutrition	(133,016)	(132,470)	(-100)	—	(132,370)
(5) Construction or acquisition of buildings, facilities, and equipment at new Southwest Irrigation Field Station, Brawley, Calif...	a/ —	a/(185,000)	—	(+185,000)	—
e. Agricultural engineering	1,140,140	1,111,880	- 6,880	—	1,105,000
(1) Farm machinery.	(389,431)	(368,240)	(-6,300)	—	(361,940)
(2) Farm structures and related investigations	(242,907)	(248,360)	(-200)	—	(248,160)
(3) Mechanical processing of farm products	(292,107)	(271,730)	(-210)	—	(271,520)
(4) Farm electrification investigations	(215,695)	(223,550)	(-170)	—	(223,380)
Subtotal	10,645,884	10,695,350	-22,850	+36,100	10,636,400

a/ The 1950 fiscal year excludes $100,000 contract authorization contained in the 1951 Agricultural Appropriation Act for construction or acquisition of buildings, facilities and equipment for the station at Brawley, California, and fiscal year 1951 includes $100,000 appropriated in the Supplemental Appropriation Act, 1951, for liquidating obligations incurred pursuant to the contract authorization.

(Continued on next page)

Project	1950	1951 (estimated)	Increase or decrease: GSA Adjustment	Increase or decrease: Other	1952 (estimated)
2. National Arboretum:					
a. Operation and maintenance	102,638	104,700	-50	—	104,650
b. Development of physical facilities	70,070	43,950	—	—	43,950
Subtotal	172,708	148,650	-50	—	148,600
Unobligated balance	+62,889	—	—	—	—
Total available	10,881,481	10,844,000	-22,900	-36,100	10,785,000
Transfer from:					
"Salaries and expenses, farm housing, Department of Agriculture" pursuant to: Public Law 843	-5,000	—			
Transfers in 1951 estimates from:					
"Research and Marketing Act of 1946, Department of Agriculture"	-1,454,162	—			
"Special research fund, Department of Agriculture"	-624,210	—			
"Salaries and expenses, Soil Conservation Service"	-203,400	—			
"Salaries and expenses, farm housing, Department of Agriculture"	-37,462	—			
Transfer in 1952 estimates to: "Salaries and expenses, Office of Information".....	+893	+650			
Transfer in 1952 estimates from: "Operating expenses, National Institutes of Health, Public Health Service"	—	-60,000			
Reduction pursuant to Section 1214	—	+224,300			
Total appropriation or estimate	8,558,140	11,008,950			

(Continued on next page)

INCREASES AND DECREASES

Project 1. Plant, Soil, and Agricultural Engineering Research

(1) Increase of $63,900 for field crop investigations as follows:

(a) Increase of $28,900 to develop wheat varieties resistant to new races of stem rust.

Problem and Need: For the past 15 years resistant varieties of hard red spring and durum wheats have been grown on most of the commercial acreage in the North Central States where stem rust formerly caused heavy losses. These varieties were developed in cooperative breeding programs which incorporated good quality and yield with resistance to stem rust. Until this past year, losses from stem rust in these wheats have been negligible. During the 1950 crop year, however, two races of stem rust known as 15 and 15B, the most virulent ever reported in North America, became generally prevalent from Mexico to Canada. Heavy losses occurred, especially on durum varieties. It is estimated that in 1950 these races of stem rust caused a reduction in durum wheat production of about one-fourth or 10 million bushels valued at about 20 million dollars.

Only a small amount of inoculum was available early in 1950, and it was late in the season before the disease became of epidemic proportions. The commercial hard red spring and hard red winter varieties were early enough to escape serious damage except in isolated cases. They are, however, susceptible to these races and, based on past experience would be expected to suffer heavy losses when inoculum of 15 and 15B is abundant earlier in the season. Stem rust spores from the northern states and Canada normally are carried south by winds in the fall. If weather conditions are at all favorable they infect winter wheat in south Texas and northern Mexico and produce abundant inoculum. Great quantities of spores are then available the following spring and are carried north by air as the wheat crop approaches heading in states to the north. Large quantities of inoculum of races 15 and 15B were present in 1950 in the spring wheat states and were blown south in the fall. Heavy infection has been observed on wheat in the South and if weather conditions are favorable for the disease to overwinter there, spores from these areas will constitute a serious menace to the wheat crop in 1951, and the threat will be continued in future years.

Recognizing the emergency that exists, $10,000 was made available in 1951 from other research activities to support the work on stem rust. This will permit the more rapid increase of certain breeding lines which appear to have some resistance to stem rust races 15 and 15B, and some additional testing in the greenhouse for resistance of breeding lines. The total available in 1951 for the program (approximately $30,000) is still inadequate to develop the necessary pathologic research and breeding programs or undertake the thorough testing of world collections of wheat which must be done quickly to provide the information and materials essential for a breeding program

adequate to meet the needs of the situation. A conference of scientists interested in wheat problems, representing several state experiment stations, Canada, and Mexico, met in St. Paul, Minnesota, on November 17 and 18 and strongly urged support for increased research to develop rust resistant varieties.

Plan of Work: Because of the north and south spread of rust spores, and over-wintering on wheat in the south, it is important to develop resistant varieties adapted not only to the durum and hard red spring areas of the North, but also to the hard red and soft red winter wheat regions of the South. Accordingly, the breeding program would be conducted both in the North (in cooperation with the Minnesota and North Dakota agricultural experiment stations) and in the South (in cooperation with Texas and Kansas). It would provide for:

(1) Searching the world collection for wheats that are resistant to stem rust races 15 and 15B and other virulent races for use in the breeding work.

(2) Stepping up the breeding program so that more plant materials can be produced and tested, thereby increasing the probabilities of finding resistant varieties of good quality. This would include greater use of greenhouse facilities and more rapid increase of materials through growing a winter generation at field stations in the South.

(3) Developing improved techniques for measuring different types of resistance in breeding materials.

(4) Developing techniques for locating and transferring resistance from related grasses to wheat.

(5) Combining resistance to virulent races of stem rust with resistance to other diseases and insects and good quality of grain adapted for growing in the several wheat areas.

1(b), (2), and (4) The Budget estimates reflect a net decrease of $100,000 for the new Southwest Irrigation Field Station, Brawley, California consisting of:

(a) A decrease of $185,000 under "Soils, fertilizers, and irrigation investigations" due to elimination of the non-recurring items provided in the 1951 Agricultural Appropriation Act and the Supplemental Appropriation Act, 1951, for construction of buildings and facilities at the field station.

(b) An increase of $85,000 to develop a strong regional research program at the new Field Station, to improve grain, forage, sugar, and vegetable crop production and to determine the soil and water management practices which will produce the best crop yields on a sustained basis.

Note: For convenience, a consolidated justification is shown at this point. The increase is distributed by projects as follows:

(1b)	Field crop investigations	$35,000
(2)	Horticultural crop investigations	25,000
(4)	Soil, fertilizer, and irrigation investigations	25,000
	Total	$85,000

Need for Increase: The program for the construction or acquisition of buildings and facilities at the new Southwest Irrigation Field Station will have been completed by the end of fiscal year 1951. The cost to the government will approximate $326,500, including the appraised value of $41,500 for the 80 acres of land on which the station is located, which was obtained from the Imperial Valley Farmers' Association in exchange for the station property (now closed) at Bard, California. The Brawley station consists of 80 acres of Federally-owned land, and an adjoining 52-acre tract held under a 99-year lease from the Association. In addition, the Association has purchased another 50-acre tract which it is making available for experimental work. When completed, the facilities will include a well-equipped laboratory and office building, a crop service building, a machinery building, garage, two residences (for the superintendent and farm foreman), quarters for scientists doing seasonal work at the station, and roads, walks, and utilities.

A broad research program is planned to include improvement and production investigations with vegetable, fruit, forage, cereal, seed-flax, sugar-beet, and sorghum crops, and research on soil and water management practices and crop rotations to produce maximum crop yields on a sustained basis. The research will be applicable to the Imperial Valley and other irrigated valleys of the Southwest, especially those listed below:

Area	Irrigated Acres a/	Total Irrigable Acres a/	Total Value of Agricultural Products, 1948 b/
Imperial Valley, California	400,000	523,000	$90,801,000
Salt River Valley, Arizona	336,000	336,000	44,903,000
Coachella Valley, California	16,000	85,000	15,891,000
Yuma Valley, California-Arizona	58,800	67,300	15,323,000
Palo Verde, California	38,000	75,000	No report
Gila Project, Arizona	18,800	20,800	No report

a/ Bureau of Reclamation report "The Colorado River" 1946.

b/ Data from Bureau of Reclamation; represents farm value.

The Imperial Valley is one of the most intensive farming areas of the United States. In 1948, almost $120,000,000 of agricultural products (valuation at shipping point) were shipped out of the valley. Agricultural production is well diversified as shown by the following tabulation of such shipments:

Product	Cars	Estimated Value at Shipping Point
Field Crops		
Alfalfa and alfalfa meal	20,626	$ 9,686,280
Flax, flax straw and fiber ..	3,972	20,773,633
Sugar beets and by-products .	24,891	15,760,920
Barley, wheat, milo, etc. ...	1,571	3,625,946
Total, field crops	51,060	49,846,779
Vegetables		
Lettuce	16,801	17,204,224
Carrots	6,391	12,302,675
Cantaloupes, watermelons, etc.	5,755	8,628,300
Tomatoes	3,150	5,608,800
Cabbage	1,005	636,583
Other vegetables	1,287	2,212,575
Total, vegetables	34,389	46,593,157
Fruits and Nuts		
Grapefruit	452	417,648
Other citrus, grapes, dates, pecans, etc.	- --	615,700
Total, fruits and nuts .		1,033,348
Vegetable seeds and cut flowers	- -	385,000
Cattle, sheep, and other animal products	- -	19,268,708
Total		117,126,992

The Imperial Valley Farmers' Association has been very active in supporting the station. Growers, shippers, and allied organizations have contributed over $97,000 for the purchase of the land made available for experimental purposes and the Association plans to apply the proceeds from the sale of the Bard Station to the development of the Brawley Station.

Some of the more important research needs requiring immediate attention include:

1. Forage crop improvement, primarily alfalfa improvement and seed production of grasses and legumes, and the determination of varieties or strains and desirable mixtures best suited for use in crop rotations. Work terminated at Bard, California, on the improvement of African and India Alfalfa varieties should be continued.

2. Flax improvement with primary emphasis on developing, selecting, and testing improved varieties resistant to wilt and other diseases.

3. Development and testing of sugar sorghum varieties as potential sources of supply for prolonging the operation of sugar factories now confined to processing sugar beets, and date-of-planting studies with sugar sorghums and sugar beets to determine the effect on maturity and possible prolonging of the processing period.

4. Vegetable crop improvement, particularly the development of improved mosaic-resistant melon varieties adapted to seasonal production during the long 10-month frost-free growing season, and for the development of improved disease-resistant varieties of lettuce and other intensively grown vegetable crops. Disease problems have been a menace to the industry, particularly because of the large concentrated areas of production.

5. Development and testing of citrus and date seedlings.

6. Investigations on kinds and forms of fertilizer, and rates, time, and methods of application for all major crops.

7. Investigations on rates of water use and methods of irrigation. Irrigation is by Colorado River water, which contains approximately one ton of salts per acre-foot of water. Temperatures are extremely high, water use is heavy, and more efficient water management is needed to avoid loss of land because of alkali conditions. Research is needed to develop optimum combinations of irrigation, drainage, soil management and fertilizer practices to obtain maximum yields on a sustained basis.

Concurrently available funds for the operation of the station and the conduct of research work approximate $50,000. Since the annual costs for station maintenance and operations alone approximates $25,000 including the cost of farm foreman and laborers, provision of utilities, and maintenance of buildings, roads, and grounds, there is only about $25,000 left for research work. This is entirely inadequate to meet the needs for research or to properly make use of the facilities which have been provided.

Plan of Work: Research on the improvement and production of forage, flax, sugar sorghum, sugar beets, melons, lettuce, citrus, dates and other field, fruit, and vegetable crops, and on soil, fertility, and water management problems would be initiated, or the present limited investigations expanded. Two horticulturists to handle the fruit investigations and assist with the vegetable investigations now being conducted, an agronomist and a pathologist to handle the forage and other field crop improvement work, and a soil scientist for the soil, fertility and water management investigations, would be employed. They would be assisted by professional and agricultural aides. Selections from improved varieties would be tested not only in the Imperial Valley but also in the other irrigated valleys of the region, and those found worthy would be released for commercial production. Projects would be integrated with work of the California Agricultural Experiment Station and with the Bureau's entire research program.

(3) Increase of $35,000 under "Forest diseases", to develop practical methods for controlling oak wilt.

Problem and Need: In 1944, a newly recognized fungus, *Chalara Quercina*, was described as the cause of the dying of oaks in Wisconsin. Important stands of oaks in Wisconsin, Iowa, Illinois and other states have now been killed by the disease. In 1949, the disease was found in northwestern Indiana and in southern Missouri. Surveys in 1950 (financed from Forest Pest Control funds), have extended the known range of the disease into northern Arkansas, southeastern Nebraska, and northeastern Ohio. It was also reported at one location in central Pennsylvania.

The disease attacks all important oak timber producing species native in the Mississippi valley and eastern sections of the United States, but is more severe on red and black oaks than on white oaks. Red and black oaks are killed within a year; white oaks more slowly. The fungus has also been isolated recently from Chinese chestnut trees that showed symptoms of disease.

Approximately one-third of the hardwood sawtimber stand in this area is oak. Oaks are among our most important timber trees because of their wide use for flooring, furniture, cooperage, railroad ties, and numerous specialties. Oaks are also widely used as shade trees in nearly all parts of the country. The acorns are important sources of food for wildlife.

The reports of the occurrence of the disease in new areas where oak occupies hundreds of thousands of acres, often in almost pure stands, have caused much alarm among foresters, lumbermen, nurserymen, and state and city officials. They are concerned about the possibility that oaks may go the way of chestnuts and want to know what, if anything, can or needs to be done about the disease.

Although the fungus cause of the disease has been determined, very little is known regarding the means of spread, the rate at which it builds up in an infection area, or the degree of susceptibility of the various oak species. Some of the infection areas in the Ozarks cover 3 to 5 acres, while others are limited to centers of a half-acre or smaller. Many new centers started in 1950. Large oaks appear to be the first stricken, suggesting that the disease is carried by some agent flying over the forest canopy. The urgent problem is the determination of how the disease spreads from one locality to another. Until basic information is obtained on these problems, no soundly based control measures can be devised.

Plan of Work: Headquarters for the work would be at Columbia, Missouri, in cooperation with the Missouri Agricultural Experiment Station and the Bureau of Entomology and Plant Quarantine for which the Budget Estimates propose an increase for research to determine whether insect vectors carry oak wilt and how such carriers might be controlled.

Research would be directed primarily toward the development of control measures for the disease. Studies would be conducted to determine (a) how the disease spreads from one locality to another (b) the value of tree removal or the rapid killing of infected trees by poisoning, and (c) the effectiveness of various spraying and chemical treatments. Plots would be established in oak stands, and records kept of the increase in size of the areas of infection, the number, size and species of oak affected, rapidity of sympton development, and the rate of deterioration of dead trees. The relative disease resistance of the various species of oak would be determined by inoculation and observation. The fungus would be studied in the laboratory and field to determine the stages of development that are involved in spread of the disease. Search would be made for spore forms not now recognized, and to determine if other kinds of plants harbor the fungus and are important in its spread. The susceptibility of Chinese chestnut to the fungus would be investigated to determine its effect on the developing chestnut industry.

Recognizing the menace of oak wilt to our forest and shade trees, $10,000 was made available in 1951 from other forest disease research to study oak wilt. This has permitted the assignment of one pathologist to work on the problem cooperatively with the Missouri Agricultural Experiment Station and others. Such funds, however, are inadequate to provide for the scientific staff and operating costs of a research program intended to develop quickly effective control measures.

CHANGES IN LANGUAGE

The estimates include proposed changes in the language as follows (new language underscored; deleted matter enclosed in brackets):

Plant, soil, and agricultural engineering research: For expenses necessary for investigations, experiments, and demonstrations concerning plants, soils, and agricultural engineering, including those related to the production, improvement, handling, processing, transportation, and storage of farm and other crops; control of weeds, plant diseases, and nematodes; discovery and introduction of new and useful plants, both foreign and native; soil and water management to improve soil productivity; the relation of soils to plant, animal, and human nutrition; classification and mapping of soils; fertilizers, liming materials, and soil amendments; farm machinery and processing equipment; farm buildings, and farm electrification; and for the operation and maintenance of airplanes; $10,636,400.

[For expenses necessary for investigations, experiments, and demonstrations in connection with the production and improvement of farm crops and other plants and plant industries; soils and soil-plant relationships, and the application of engineering principles to agriculture; plant diseases, including nematodes, and methods for their prevention and control; plant and plant-disease collections, and surveys; the distribution of weeds and means for their control; methods of handling, processing, transportation, and storage of agricultural products; and plants in foreign countries and our possessions for introduction into the United States, including explorations and surveys, and propagation and testing in this country; and for the operation and maintenance of airplanes, as follows:]

[Field crops: For investigations on the production, improvement, and diseases of alfalfa, barley, clover, corn, cotton, flax, grasses, oats, rice, rubber crops, sorghums, soybeans, sugar beets, sugarcane, tobacco, wheat, and other field crops, $3,437,500.]

[Fruit, vegetable, and specialty crops: For investigations on the production, improvement, and diseases of fruit, vegetable, nut, ornamental, and related crops and plants, $3,012,500.]

[Forest diseases: For investigations of diseases of forest and shade trees and forest products, and methods for their control, $452,500.]

[Soils, fertilizers, and irrigation: For investigations of soil management methods to increase and maintain productivity, including fertilization, liming, crop rotations, tillage practices, and other means of improving soils; fertilizers, fertilizer ingredients, and their improvement for agricultural use; soil management and crop production on dry and irrigated lands, and the quality of irrigation water and its use by crops; and for the classification of soils in a national system and indication of their extent and distribution on maps, and determination of their potential productivity under adapted cropping and improved soil management, $2,723,750, including not to exceed $100,000 for construction or acquisition of buildings, facilities, and equipment for the station at Brawley, California.]

[Agricultural engineering: For investigations involving the application of engineering principles to agriculture, including farm power and equipment, rural water supply and sanitation, and rural electrification; farm buildings and their appurtenances and buildings for processing and storing farm products, and the preparation and distribution of building plans and specifications; cotton ginning; and other engineering problems relating to the production, processing, transportation, and storage of agricultural products; $1,130,000.]

[SOILS, FERTILIZERS, AND IRRIGATION]

[For an additional amount for "Soils, fertilizers, and irrigation", $100,000, for payment of obligations incurred pursuant to authority granted under this head in the Department of Agriculture Appropriation Act, 1950, to enter into contracts for construction or acquisition of buildings, facilities, and equipment for the station at Brawley, California, including architectural and other costs previously incurred in connection therewith.]

The changes in language propose the deletion of the language under five subappropriations and the consolidation of the items into a new single subappropriation "Plant, soil, and agricultural engineering research," as follows:

Present	Proposed
1. Field crops	Plant, soil, and agricultural engineering research
2. Fruit, vegetable, and specialty crops	
3. Forest diseases	
4. Soils, fertilizers, and irrigation	
5. Agricultural engineering	

This consolidation is proposed for the sole purpose of simplifying the appropriation structure and administration of the Bureau, and will in no way affect the nature or scope of the research work authorized and conducted. Work previously performed under the five subappropriations which are consolidated is now represented without change by the five respective projects or activities under "Plant, soil, and agricultural engineering research."

The language included in the 1951 Appropriation Act and in the 1951 Supplemental Appropriation Act providing funds in connection with the construction or acquisition of buildings, facilities, and equipment at the Southwest Irrigation Field Station at Brawley, California, is proposed for deletion since the building program at the Brawley station will be completed during the fiscal year 1951. Therefore, retention of the language is unnecessary.

STATUS OF PROGRAM

Plant, Soil, and Agricultural Engineering Research

FIELD CROP INVESTIGATIONS

Research is conducted on the production and improvement of the principal farm crops including cereal, cotton, forage, sugar, tobacco, and other important food, feed, fiber, and oil crops, and on the control of weeds. These crops provide the major sources of our food, feed for our livestock, fibers, oils, and important soil-improving and soil-conserving crops. For the 1950 crop or marketing year, they had a total farm value of approximately $15,450,000,000.

New problems are continuously arising in this field and demanding solution, as for example:

Two new races of stem rust, the most virulent ever reported in North America, became prevalent in 1950 in 17 states from Mexico to Canada and caused heavy losses, especially on durum wheat varieties where production was reduced over 20 per cent, a loss of around 20 million dollars.

Black shank of tobacco in 1950 spread widely through the burley-producing area and was especially destructive in eastern Tennessee where it first occurred in 1949. The disease threatens to wipe out burley tobacco production.

Selected Examples of Recent Progress:

1. Corn hybrids resistant to corn borers are being developed. Resistant hybrids have been developed and are already in use in the eastern part of the corn belt where the corn borer has been present for a long time. In Ohio, for example, more than one million acres of the 1950 corn crop was planted with hybrids possessing some corn borer resistant characteristic. In the western part of the corn belt where the corn borer invasion has been recent, resistant hybrids are now being developed. Adequate sources of resistance are available, but incorporating them into the many commercial hybrids adapted to specific localities will take several years because each must go through the long chain of cross breeding, back crossing, in-breeding, and double crossing.

2. New wheat varieties have come to the lead in popularity with farmers. Pawnee, Comanche, and Triumph, three recently introduced winter wheat varieties, and Mida, a recent spring wheat introduction, were the most widely grown varieties in 1949. Pawnee, alone, occupied nearly 11,000,000 acres. Five years ago these varieties were grown on no more than a few thousand acres.

3. Lee, a superior variety of hard red spring wheat, has been introduced. Resistance to all races of leaf rust known to be present in North America has been combined into this new variety which was distributed in Minnesota in 1950.

4. Andrew, a new high-yielding oat variety introduced in 1950, is adapted over a wide area. Among 30 entries grown in tests located over a wide area during each of the last 8 years, Andrew topped the list in average yields.

5. New rice variety lengthens harvesting season. Century Patna is an early maturing variety of long slender-grain type rice adapted to Arkansas, Louisiana, and Texas. It can be grown along with mid-season and late-maturing varieties to spread rice harvesting over a longer period.

6. Redwood, a new variety of flax, is resistant to all races of flax rust known to occur in North America. In this variety adapted to the North Central States plant breeders have combined high oil content, good quality, superior yield, and disease resistance. Redwood straw also rates high in fiber characteristics, making it useful in the manufacture of high grade paper.

7. Grassy weeds in sugar beets controlled with TCA (sodium trichloracetate). Pre-emergency applications of from 5 to 10 pounds of TCA per acre have been found effective without damaging beets. Commercial scale tests on both sugar beets and table beets were highly successful in 1950. The TCA weed killer will probably be used rather extensively with sugar beets in 1951.

8. Weeds in cotton may be controlled with chemicals. A combination of dinitro and light herbicidal oil gave excellent weed control in Mississippi tests without effecting yields. The chemical treatment cost $6.55 per acre compared with $14.00 for hoeing the untreated plots. Also, promising results have been obtained with herbicidal oils alone. Additional studies are still needed before chemical weed control methods can be recommended for cotton.

9. New cotton hybrids have superior yarn strength. Lint produced in 1949 from inter-species cotton hybrids gave yarn strengths about 50 per cent above the average for commercial cottons of the same staple length. Much more breeding work is needed, however, before cotton growers can realize the advantage of these hybrids. At the present stage of development yields are only 1/3 to 1/2 of commercial upland varieties.

10. Heavy-yielding, high-oil-content soybeans have been developed for most of the soybean belt. Blackhawk, a superior variety for the northern part of the main soybean area, has been introduced for 1951. Most other areas have been furnished comparable varieties through soybean breeding during the past decade. The superior varieties generally have increased yields by 20 per cent and increased soybean oil content by 10 per cent. Breeders are now working on such varieties for the southern soybean area of the upper Mississippi Delta.

11. Pastures in crop rotations add to profits. More forage was produced from Kentucky bluegrass and alfalfa-bromegrass pastures during 4 years in rotations than during six years in permanent pasture in tests in Wisconsin. In addition to the forage, one crop of corn and one crop of oats was produced in the six-year rotation.

12. A potential legume crop found for the Great Plains. The discovery of old stands of yellow siberian alfalfa that have persisted in South Dakota for more than 40 years has provided a wealth of breeding material already adapted by natural selection to adverse conditions of this area. This strain of alfalfa apparently will thrive under normal conditions in the semi-humid region, and survive while holding the soil in place during extreme dry periods. An extensive program of breeding and testing will be needed if this strain of alfalfa is to be made into a dependable legume crop for the 200 million acre dry-land area.

13. A new strain of Korean lespedeza developed in cooperation with the North Carolina Agricultural Experiment Station, is resistant to root knot nematodes and powdery mildew. Nematodes are a serious hazard to lespedeza production in the Upper Coastal Plain. Seed is not yet available in commercial quantities but stocks are being increased.

14. Resistance to crown rot has been attained in white clover. From more than 60,000 Ladino clover plants subjected to stringently controlled tests, 21 plants with considerable resistance to crown rot were selected. These are being used to develop a crown rot resistant variety, and for development of further breeding material with an even higher degree of resistance to this disease which is a major factor in losses of Ladino clover stands in eastern states.

15. Ergot resistant hybrids of Dallis grass found. Dallis grass, the most important perennial summer pasture grass in the South, has been limited in usefulness because of susceptibility to ergot and consequent danger of poisoning to livestock. Through special breeding technics, including careful control of temperature and length of day during flowering, hybrids were obtained in cooperation with the Mississippi State Agricultural Experiment Station. Out of several thousand plants produced in the third generation following crossing, there were 7 ergot immune hybrids. Seedling progenies from these are now being grown and studied as the next step in developing an ergot immune Dallis grass variety.

16. Fertile hybrids of zoysia lawn grasses have been produced which make possible the development of a valuable turf producing species for the "crabgrass belt" and the South. Plant breeders are now working to combine into one variety the fine-leaf characteristics of Mascarene grass and Manila grass with the winter hardiness, heavy seed production, and bluegrass compatibility qualities of Japanese lawngrass.

17. New sugar beet variety combines resistance to black root and leaf spot, two of the most serious sugar beet diseases in the humid area. In tests in Minnesota the new variety withstood exposure to black root under conditions so extreme that susceptible varieties failed completely. Immediate steps have been taken to supply seed for wide-scale field trials in 1951. Release with a new "U.S." number is anticipated.

18. Sugarcane introductions from India provide source of material for developing varieties better suited to southern states. Fifty-six clones of *Saccharum barberi* imported from India in 1949 were added to the stockpile of short cycle breeding material of Temperate Zone origin available for hybridization. The new material is expected to contribute earliness and other desirable qualities to U. S. sugarcane varieties.

19. An improved syrup-type variety of sugarcane yields 50 to 75 gallons more syrup per acre than present varieties. C.P. 36/111 is not ideally suited to mechanical harvesting, but is a definite improvement for syrup-producing districts in Mississippi and Alabama.

20. Sugar sorghums offer possibilities as an off-season sugar crop in California. Experimental plantings of improved varieties of "sugar" type sorghums have produced big yields high in sucrose in the Imperial Valley when grown during the hot summer period from June to October. Sugar beets are produced in this area from October to June. Since the feasibility of extracting sugar from sorghum by standard factory operations has been demonstrated, large scale plantings of sugar sorghum have been made at the new Brawley Station to explore problems farmers will encounter in large-scale production.

21. A new burley tobacco yields more high quality leaves. Burley 1 is an improved root rot resistant tobacco that produces more of the fine-textured, thin-bodied, light-colored cigarette leaf. Under three years of testing in Tennessee the new variety yielded only 23.1 per cent of poor grade leaves while a standard variety yielded 31.5 per cent of heavy red non-cigarette leaf. Burley 1 averaged about six per cent higher dollar return per acre because of better quality.

22. Good progress being made in establishing wildfire resistance into cultivated types of tobacco. Wildfire is a serious and widespread bacterial disease affecting tobacco leaves. Since the development of the wildfire immune breeding line TL 106 in 1945, the characteristic of wildfire resistance has been incorporated into the different types of tobaccos of all major producing areas. Many experimental lines are now ready for extensive testing. Tests already completed indicate lower nicotine content and less firing, and suggesting possibilities for far-reaching improvement in disease resistance, quality, and growth characters.

HORTICULTURAL CROP INVESTIGATIONS

Research is conducted on (1) production and improvement of fruit, vegetable, nut, and ornamental crops, (2) development of economical methods of handling, processing, transporting, and storing fruits and vegetables so as to maintain quality and control diseases, (3) introduction and testing of new plant materials, and (4) control of nematodes causing crop damage. These crops include the great health protectors in our diet and are highly important staple food sources. For the 1950 crop or marketing year, they had a total farm value of approximately $2,800,000,000.

Selected Examples of Recent Progress:

1. Chemical thinning of apples becomes a commercial practice in the Pacific Northwest. About 20,000 acres of apple orchards were thinned in 1950 by using spray application of di-nitro at blossom time. In tests with Golden Delicious, chemical thinning increased yields by six boxes of apples per tree, about 15 per cent chemical thinning costs only 1/6 as much as hand thinning.

2. New methods and new materials are more effective against apple scab. Using Elgetol as a spray on the ground under the trees before blossoming, followed by two applications of phenyl mercury spray before the fruits set, gave excellent control of the primary infections of apple scab fungus during 3 years of testing.

3. A new peach rootstock, S-37, found to be highly resistant to nematodes. The use of resistant stocks should materially reduce peach losses resulting from nematodes in southern states.

4. New varieties of small fruits released. A new self-fertile table grape superior in yield and quality and adapted for California has been distributed under the name of Calmeria. Six new large fruited varieties of blueberries have been introduced for East Coast states. Three new disease resistant cranberry varieties have been named and introduced. A new large, black-fruited, trailing blackberry superior for the fresh market, canning, and freezing has been introduced in the Pacific Coast region. Sioux strawberry, a winter-hardy drought-tolerant variety that yields heavily in June, has been developed for the Great Plains area.

5. Fruit drop of Pineapple oranges reduced by 2,4-D spray. Pineapple oranges sprayed in late December with the sodium salt of 2,4-D lost only 3 to 6 per cent mature fruit by dropping by mid-February whereas unsprayed trees lost 18 per cent in Florida tests. Temple oranges were favorably affected by similar sprays, but Valencia oranges were not affected.

6. Heavy manure applications in date orchards found to be unnecessary. Investigations in California indicate that substantial savings could be realized in many date gardens by reducing annual manure applications from currently used levels of 6 to 15 tons to 2 tons per acre and applying more chemical nitrogen along with leaf and fruit stalk prunings.

7. Research indicates that crop plants differ widely in tolerance of DDT in soil. Some crops are extremely sensitive while others are unaffected. For example, production of Stringless Black Valentine snap beans was reduced significantly in soil containing 50 pounds of DDT per acre. Sweet corn growth on the other hand was unaffected in soil containing 1,000 pounds of DDT per acre. Chemical analysis for DDT in the soil revealed no significant change in DDT content after four years of weathering.

8. Congo, a new watermelon variety, resists breakage while being transported. High eating quality plus good transportability have made Congo highly acceptable to growers, shippers, and consumers in commercial scale tests.

9. Two new disease-resistant snap beans released. Contender, a market and shipping bean for the South, yields more better quality beans than Stringless Black Valentine. Topcrop, adapted to central and northern sections, is better than any other variety for home garden and local market use. Substantial quantities of seed of both varieties were available in the trade in 1950. More than one million pounds of Topcrop seed will be available for planting in 1951.

10. The market value of Red McClure potatoes was increased through the use of 2,4-D. Applications of 1/4 to 1 1/2 pounds of the sodium salt of 2,4-D improved the skin color and market value of Red McClure potatoes grown in Colorado without significantly depressing yields.

11. Tulips can be forced to flower in winter months with artificial light. Possible practical application by the flower industry is indicated from experimental studies in which flowers of satisfactory quality were produced by artificial light. Conditions for optimum production and adaptability of different varieties to such culture are being studied.

12. Test plant is found for quick detection of chrysanthemum stunt. The saving of a year in testing propagating stock is made possible by the discovery of Cineraria as a carrier of stunt that shows symptoms quickly. Stunt usually does not express itself until the second year, but it appears in Cineraria as early as 4 weeks after inoculation.

13. Thirty-one new varieties of chrysanthemum and azalea introduced. During the past year, 21 new varieties of chrysanthemum were named and introduced including 10 developed especially for northern areas and 11 for the South. The ten new azaleas introduced include garden varieties for as far north as New England and others especially adapted for forcing in pots by florists for Christmas and Easter.

14. Growth regulating properties found in many new chemicals. During the past year, 539 compounds were tested for plant growth regulating activity; 100 were found to be sufficiently active to warrant further study. Some compounds inhibited stem growth and others delayed the flowering of snap beans by 3 to 10 days.

15. Pressurized cabins found to be unnecessary for transporting cut flowers by air. Low humidity and high temperature rather than effect of altitude were found to be main cause of deterioration in California tests.

16. Marketing research findings have cut refrigeration costs on California early potatoes by $1,000,000 annually. Transportation investigations revealed that one re-icing in transit is enough for potato shipments in April and May and that two re-icings are enough in summer months. Most daily re-icing has since been discontinued.

17. Prepackaging adds nothing to the keeping quality of fruits and vegetables. Investigations have revealed that prepackaging in consumer units is no substitute for refrigeration. Similar studies with various types of film wraps indicate that small perforations are needed to allow entrance of oxygen and escape of carbon dioxide to keep most commodities in good condition.

18. Potato varieties vary greatly after storage for making chips. Tests on chipping quality of potatoes have shown that some varieties possess the property of being easily reconditioned for frying after storage while others do not. High specific gravity of potatoes was correlated with good chipping quality and low absorption of oil. The chipping industry uses about 10 per cent of the potato crop.

19. Much germ plasm continues to move through the Division of Plant Exploration and Introduction. During fiscal year 1950, 9,375 plant introductions were handled from 40 foreign countries, and more than 8,000 items were sent to 65 foreign countries. Introduced germ plasm is a primary source of genes for plant improvement.

FOREST DISEASE INVESTIGATIONS

Research is conducted to develop methods for preventing or controlling diseases on the millions of acres of national forests, parks, and other timbered areas, and diseases of shade trees and forest products. It serves the Forest Service and other governmental bureaus, State forestry agencies, municipalities, and private owners and is conducted in cooperation with them. Losses from disease approach or exceed the losses from fire. The work consists primarily of (1) identifying diseases of forest trees and products and determining their life cycles, and (2) developing effective and economical control methods and management practices, including the development of disease-resistant varieties.

Selected Examples of Recent Progress:

1. Disease resistant elm released. In carefully controlled experiments the Christine Buisman elm has demonstrated resistance to both Dutch elm disease and to phloem necrosis, the killing virus disease that is prevalent in the Midwest. Enough own-rooted stock has been produced from root cuttings to supply propagating stock to 53 interested commercial growers in 17 states. Planting stocks should be available from these nurseries within 3 years.

2. Methods have been found for controlling pine seedling root disease. Soil fumigation with ethylene dibromide before beds are seeded has proven effective in preventing root disease of southern pine nursery seedlings. As a result of this treatment a large Forest Service nursery, formerly threatened with abandonment because of the diseases, has resumed large-scale production of long-leaf, slash, and loblolly pine seedlings. Treatment of heavily diseased sections of the nursery increased the production of plantable stock by 40 per cent, valued at 10 times the cost of treatment.

3. Improved methods have been developed in cooperation with the Forest Service for estimating more accurately in California forests the amount of cull timber due to decay. Errors in cull estimation in timber stands have been an important cause of financial difficulties in lumbering operations. In the future, cull due to decay will likely be higher in the timber to be logged in California and accordingly the improved methods of estimation will be even more vital than in the past.

4. Decay of stored pulpwood may be effectively delayed by small amounts of fluorides applied as a spray in pulpwood piles. The surprisingly protective effect of the fluorides has been indicated in recent preliminary studies in the South conducted in cooperation with the Forest Service. The fluorides apparently stimulate a relatively harmless mold which has an antibiotic effect on the decay organisms and makes the wood much more permeable to various fluids. Decay of stored pulpwood develops faster in the South than in the North. The studies in the pulp industry are being continued and the possible applications of these effects to other fields are being explored.

SOILS, FERTILIZERS, AND IRRIGATION INVESTIGATIONS

Research is conducted in the following four related fields:

Soil improvement, management, and irrigation investigations, including studies of fertilization, liming, tillage, crop rotation, and other production practices. These investigations are conducted at 46 field locations in dry-land, humid, and irrigation regions and are supported by basic laboratory investigations into soil-plant relationships, including studies of tilth, moisture, fertility, and soil organisms. Salinity problems related to soil and crop management are also studied.

Fertilizer, liming material, and soil amendment investigations to improve the properties, efficiency, and availability of these materials to plants. Farmers now use annually approximately 46 million tons of these materials having a retail cost of more than 750 million dollars.

Soil surveys to classify soils in a national system. Soil maps and reports are published for use in recommending and applying soil and crop management practices on individual farms and for numerous land-use programs of Federal and State agencies.

Basic research regarding the effects upon plant nutrition of various mineral elements and growth factors in the soil and, through plants used as food, the effect of these elements on animal and human nutrition.

The program is closely integrated with the soils work of State agricultural experiment stations, the Soil Conservation Service and other Federal agencies. Such integration and cooperation facilitates effective planning and research on the most urgent problems.

Specific problems to which efforts are being directed include:

1. Increased production of feed crops in the South, through better fertilizer practices and cropping systems.

2. The development of improved soil management and crop production practices for newly irrigated lands, such as are being developed in the Columbia, Lower Colorado, Missouri, and other river basin areas, as well as for older irrigation projects.

3. Determination of the fertility needs and management practices for maintaining and improving productivity of dry-land areas where fertility levels are now declining.

4. Improvement of mixed fertilizers of higher analysis by granulation to better the properties affecting packaging, storage and availability of nutrients to plants.

5. More accurate determination of the availability and use of nutrient materials by plants by use of radioactive materials.

6. Preparation of reconnaissance and detailed soil surveys of lands under consideration for development through irrigation or drainage in several river basins.

7. Improvement of the nutritive value of plants for human consumption and as a means of avoiding nutritional troubles in animals by studying the effects of fertilizer applications and other variables on the vitamin and mineral content of plants.

Selected Examples of Recent Progress:

1. Research is charting the course for settlers on newly irrigated lands in the Columbia River Basin. The first farm units will receive water from the Grand Coulee dam system in 1952. Already studies on developmental farms have revealed that settlers will be able to grow such cash crops as alfalfa, sugar beets, corn, small grains, and vegetables. Crop varieties have been tested and fertilizer and irrigation rates have been determined. Yields per acre as high as 37 tons of sugar beets, 9 tons of alfalfa hay, 170 bushels of corn, 155 bushels of grain sorghum, 113 bushels of oats, 85 bushels of barley, 73 bushels of winter wheat, and 58 bushels of spring wheat have been produced.

2. Cost of tobacco fertilizer might be cut 15 per cent by new discoveries. Intensive investigations have shown that only half as much nitrogen is available from water insoluble sources as from standard water soluble sources. Water insoluble nitrogen is now used in most tobacco fertilizers. By switching to standard soluble sources tobacco fertilizer can be made 15 per cent cheaper and the quality improved. A few fertilizer manufacturers are already making the shift.

3. Climatic factors other than precipitation are found to be potent in determining crop yields in dry land areas. Relative humidity during July and August was found to be most closely related to sorghum yields. Wheat yields were found to be more dependent on rainfall at critical periods than on rainfall for the crop season as a whole.

4. Mulch improves yields of fall-planted potatoes at Yuma, Arizona. A mulch of 3 to 4 inches of alfalfa straw over Warba potato plantings in sandy soils greatly increased potato yields. On the bare plots yields were 13, 27 and 82 bushels per acre for August 15, September 1, and September 15 planting dates respectively, as compared to 89, 125 and 173 bushels for mulched plots on corresponding planting dates. Delay of the planting date on both mulched and unmulched fields increased yields and the Pontiac variety outyielded the Warba variety under mulch. The chief benefit of the mulch appears to result from lower temperatures at the seed piece depth in the soil.

5. Urea-form preparations found to be less effective than soluble nitrogen materials for certain crops. In 1949 about 1,400 pounds of urea-form were supplied for field tests on grass, tobacco, small grains, sugarcane, pineapple, corn, citrus, and cranberry in 12 states, Hawaii, Puerto Rico, and Canada. Urea-form was generally less effective than readily soluble nitrogen materials as fertilizer for citrus, small grains, and most crops. Urea-form gave good performance on centipede grass in Georgia, turf grasses in Ohio, and tobacco in Connecticut. Experiments with perennial ryegrass gave evidence of a delayed action and ability to supply available nitrogen over long periods of time. About 1,700 pounds of the material were prepared for field evaluation in 1950.

6. The use of chemical fertilizers on farms has increased $2\frac{1}{2}$ fold during the past ten years and now accounts for more than 1/5 of the total U. S. food production. Consumption in 1949 totaled 18,542,000 tons compared with 7,912,000 tons in 1939. At the same time the average plant nutrient content has gone up from 19.8 per cent in 1939 to 21.2 per cent in 1949. These advances have resulted largely from farmers and the fertilizer industry putting into use new knowledge developed through fertilizer and soil management research.

7. The first domestic plant especially designed for granulation of dry-mixed fertilizers was founded on the bases of research findings. The first commercial plant of this type was placed into operation during the last year. The fundamental characteristics of procedures used in developing the plant were based in a large part on past research studies of this Bureau.

8. Radioactive phosphorus experiments have revealed that water soluble phosphates supply more phosphate to crops the first year than other forms, especially in the calcarious soils of the West. This information is serving as a guide for commercial production of phosphate from western deposits. Experiments are now under way in twenty states, and 50 field tests were carried out during the year. These experiments are aiding materially in advancing knowledge about the use of phosphate fertilizers and in studying plant root development and fertilizer placement.

9. Factors influencing the vitamin content of plants are being studied at the U. S. Plant, Soil and Nutrition Laboratory. Findings indicate that the amount of light is apparently the most important factor in determining the ascorbic acid content of leafy vegetables and tomatoes, while storage is of considerably more importance in determining the ascorbic acid content of potato tubers than are the climatological variables measured.

10. Some crops found to be tolerant of salinity in Western soils. Many soils of the West contain salts in quantities sufficient to seriously limit plant growth. Investigations on the tolerance of 13 truck crops, more than 20 forage and other field crops, and citrus and stone fruits has made possible a listing of these crops in order of their ability to grow satisfactorily on saline soils. The influence of climatic factors on the salt tolerance of crops has been determined. Alfalfa, barley and several truck crops show very substantial varietal differences in salt tolerance.

11. Six million acres mapped for soil surveys last fiscal year. Detailed basic soil maps for 5,595,500 acres and semi-detail and reconnaissance maps for an additional 544,600 acres were completed. Field surveys were in progress in 54 counties, 9 of which were completed. A total of 1,589 soil surveys have now been published.

12. Soil surveys in Missouri Basin. Soil surveys to provide the basic soil data for classifying land in proposed irrigation projects were initiated during the past year in five states in the Missouri Basin. One survey has been started in each of four states and two in one state. These surveys are being made so as to provide detailed information on soils required in land classification for irrigation and in subsequent development of irrigation projects.

13. In cooperation with several states fertility status of soils by counties is being determined by utilizing soil test data accumulated from the many soil samples submitted by farmers. The data in combination with adequate soil surveys, serves as a sound basis for evaluating educational and advisory programs at the county level. In Tennessee, for example, the data showed a high level of soil phosphorus in central Tennessee counties where soils were developed from phosphate rock, but lower levels in other counties. In tobacco and cotton producing counties in North Carolina, where heavy fertilizer applications have been used for a long period, soil phosphorus has been built up to a high level, while it is lower in other counties.

AGRICULTURAL ENGINEERING INVESTIGATIONS

This research is conducted in the following four major fields:

Farm machinery investigations are concerned with the improvement of farm machinery, equipment, and mechanical methods of planting, cultivating, fertilizing, and harvesting farm crops and combating their insect pests and diseases.

Farm structures and related investigations develop more effective barns and animal shelters, better structures for storing crops on the farm, and improve design and utility of farm houses. The farm investment in buildings, including houses, is approximately 20 billion dollars. Part-year storage on the farm for most of the grain, feed and perishable crops is essential to orderly marketing of agricultural products.

Mechanical processing of farm products concerns the improvement of equipment and methods for handling and processing products on the farm or at local processing plants.

Farm electrification investigations include the application of electrical energy in the form of power, heat, light and other forms as an aid in the production and processing of agricultural products, and the study of potential new uses of such energy on farms.

In the past 10 years farmers have changed from hand methods and animal power to machines more rapidly than in any other decade in history. They are using more than twice as many tractors as in 1939. Mechanization is far advanced in several crops, such as small grains and corn, but 90% of the cotton crop is still harvested by hand and some other crops still require almost as many man-hours of labor per acre as they did years ago.

Selected Examples of Recent Progress:

1. Plan-development for low cost farmhouses stepped up. A leaflet, "Four Farmhouses for the South," illustrating four low-cost farmhouse plans, has been issued. Three plans of a group developed several years ago by the Farmers Home Administration have been revised and working drawings made. A fourth is well under way. Drawings of a group of minimum-sized houses that can readily be enlarged is under way. "Heating," the sixth bulletin in the "Your Farmhouse" series, was published during the year.

2. More building plans for farm service buildings being turned out. Revision of the catalog of "Plans of Farm Buildings for Northeastern States" is ready for publication. At the request of the PMA, 17 drawings of grain bins and floor and duct systems for grain storage were prepared. Working drawings for a 10,000-bushel grain elevator with suggested drier layout were completed for use in the Midwest Plan Service. Work is continuing on the development and revision of a wide variety of plans for service buildings.

3. Bank-barns found as satisfactory as above-ground barns in production of grade A milk. Temperature and humidity studies in 26 Wisconsin barns and milk quality studies in 202 barns of both types were made because of discrimination of many milk sanitarians against bank-type barns. It was found that lighting and placement were more important than type of structure and that temperatures and humidity in barns of the bank type were lower in tests during each of the last two years.

4. Thousands of anchoring rings in use on CCC grain bins. Agricultural engineers, cooperating with industry and the Production and Marketing Administration, developed a foundation ring that successfully anchors circular grain bins against wind damage. More than 30,000 of these foundation rings are now in use on CCC grain bins throughout the grain growing states.

5. A pre-production model tung nut harvester, designed after a USDA experimental model is being manufactured. In field experiments with the experimental model two men were able to gather and bag 1 1/4 tons of tung nuts per hour.

6. Tests show low-gallonage spray applications as effective as high gallonage applications. Corn borers were controlled as effectively with low gallonage sprayers as with conventional high gallonage equipment in field experiments with DDT. These findings emphasize the need for developing equipment for better plant coverage with low-gallonage treatment. Labor costs are less with low-gallonage treatments.

7. Fertilizer placement studies underscore the importance of determining placement requirements for each crop. Onion yields were tripled in a Michigan test by placing fertilizer 3 inches below the seed, for example; while carrot yields were reduced 15 per cent because of injury to the carrot seed and seedling roots from the same fertilizer placement in a New York test.

8. Improved stripper-type cotton harvester developed. Major features of the machine include spiral brush type rollers, a pneumatic doffing and conveying system and a sidewise movement of the gathering units. Preliminary tests showed good results under conditions that reduce the efficiency of other type strippers.

9. Machines that combine jobs cut farming costs. Combining several field operations into a single one offers great opportunity for cutting costs. USDA agricultural engineers accomplished three-way weed control in cotton with a single tractor equipped with a shovel cultivator, a flame cultivator, and a weed and insect sprayer.

10. Tractor tire research reveals valuable information. USDA engineers working with industry have determined that air filled tractor tires with use of weights are more effective than water filled tires in normally dry sand and loam soils common to Southern States. Furthermore, lug height of tractor tires was shown to be important in tests in these same soils. Low lugs were superior to high ones in sand; slightly better in loam. High and low lugs were on a par in Southern clay soil.

These same tests showed that rim width had little effect on the efficiency of tractor tire operation.

11. Sulfur dioxide was found to be a good preservative agent for drying alfalfa when drying is completed with a barn-drier using natural air, in engineering tests cooperative with the Bureau of Dairy Industry on forage preservation. Under adverse drying conditions, 20 per cent more carotene and 110 pounds more dry matter were preserved when sulfur dioxide was applied at the rate of 7 pounds per ton of dry forage. The treating of uncured baled hay with sulfur dioxide slowed down respiration for a period of from one to two weeks, thus delaying heating and mold.

12. New machine developments reduce processing costs of fiber flax. Investigations designed to reduce costs in the flax industry of the Williamette Valley of Oregon have resulted in the development of a 6-foot push-type flax puller. An artificial dryer for retted straw has been designed that will greatly reduce processing costs without injury to the fiber, and construction of a full scale drying plant is underway.

13. New processing service offered in freezer locker plants. Agricultural engineers of the USDA, working with the Michigan Agricultural Experiment Station and freezer locker plant owners, developed efficient community fruit and vegetable processing kitchens that are easily incorporated in locker plant operations. Both customers and plant owners benefited from this new processing service. The community processing kitchen is apparently headed for widespread acceptance.

National Arboretum

The National Arboretum occupies a site of approximately 400 acres in the District of Columbia. Basic developmental work has largely been done, including the clearing of land, and in recent years trees and shrubs have been transplanted from nurseries to permanent planting sites. However, much material is maintained in nurseries awaiting transplanting.

A program involving estimated expenditures of more than $2,400,000 for the long term development of the needed roads, walks, buildings, and greenhouses has been developed in cooperation with the National Arboretum Advisory Council. This program, however, has largely been held in abeyance during the past two years as shown by the following tabulation:

Fiscal Year	Amount	Purpose
1948	$350,000	Acquisition of additional land.
1949	328,000	Preparation of plans; construction of a gate house with rest rooms, construction of some roads; purchase of equipment.

Fiscal Year	Amount	Purpose
1950	$ 70,000	Construction of farm machinery and shop building, fencing, grading, and miscellaneous development work.
1951	43,950	Roads, paths, grading, utilities, and miscellaneous.

During fiscal year 1950, activities at the National Arboretum were as follows:

Program for Development of Physical Facilities: Construction of approximately 2 miles of permanent roads was completed, 2 houses, acquired with the purchase of additional land, were relocated and rehabilitated, and certain woodland areas were partially cleared and the land prepared for permanent planting. Adjustments were made to permit the extension of New York Avenue by moving the permanent fence from the old property line to the new location. This involved dismantling and erecting 4,000 feet of chain link fencing. Construction of the gate house was completed in August and the farm implement building was completed in September, 1950.

Operation and Maintenance: In addition to the usual maintenance of the 400-acre tract, a very large quantity of plant material was moved from the nurseries into permanent locations. On April 27, 1950, ceremonies were held for the dedication of plantings made possible by a donation from the Garden Club of America and presented to the Secretary of Agriculture. Work has been initiated on the flowering dogwood and allied plantings which are a memorial gift from the Woman's National Farm and Garden Association.

Some 8,000 persons visited the azalea display when the Arboretum was opened to the public for three weekends during April and May. Many other visitors arranged to see the Arboretum by appointment. The American Holly Society held one field meeting at the site of the holly collections.

The herbarium continued to expand with the accumulation of plant specimens at about the same rate as in previous years.

STATEMENT OF OBLIGATIONS UNDER ALLOTMENTS, WORKING FUNDS, AND TRUST FUNDS

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Research and Marketing Act of 1946 (Title II), Department of Agriculture (Bureau of Plant Industry, Soils, and Agricultural Engineering):			
Marketing research and service ...	$357,347	$361,000	$321,000
Research on Strategic and Critical Agricultural Materials, Department of Agriculture (Bureau of Plant Industry, Soils, and Agricultural Engineering):			
For research on the development and production of domestic crops providing strategic and critical agricultural products to carry out the department's responsibility under section 7(b) of the "Strategic and Critical Materials Stock Piling Act of July 23, 1946":			
1. Research on domestic production of natural rubber	100,357	102,000	101,900
2. Investigations of domestic production of vegetable tannins	38,061	41,000	50,000
3. Investigations on vegetable oils	32,239	34,000	34,000
4. Investigations on hard fiber plants for cordage	48,684	62,000	97,000
Total, Research on Strategic and Critical Agricultural Materials	219,341	239,000	282,900
Control of Forest Pests, Forest Pest Control Act, Department of Agriculture (Bureau of Plant Industry, Soils, and Agricultural Engineering):			
Surveys to determine distribution and intensity of forest diseases and formulation of recommendations for control practices	33,819	41,500	a/

a/ Allotment for 1950 has not been determined

(Continued on next page)

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Working Fund, Agriculture, Agricultural Research Administration (Bureau of Plant Industry, Soils, and Agricultural Engineering) Advanced from:			
Atomic Energy Commission:			
For improvement of soil management and crop production through investigations with radio-active isotopes	230,318	203,995	--
Department of Defense, Department of the Navy:			
For preparation of one or more monographs of plant fibers	6,050	3,105	--
Federal Security Agency, Public Health Service:			
For collection of seeds and plants as possible sources of the drug cortisone	16,522	1,478	--
Interior Department, Bureau of Reclamation:			
For chemical and physical analysis of soils and their relation to irrigation agriculture	--	9,000	--
General Services Administration:			
For production of seed	--	19,000	--
Total, Working Fund, Agriculture, Agricultural Research Administration	252,890	236,578	--
Working Fund, Agriculture, General (Bureau of Plant Industry, Soils, and Agricultural Engineering) Advanced from:			
Department of Interior, Bureau of Reclamation:			
For studies in connection with an evaluation of the agricultural repayment feasibility of the Weber Basin Reclamation Project, Utah	--	200	--
Department of Defense, Department of the Army:			
To cover the cost of providing data in connection with a comprehensive survey of the Arkansas-White-Red River basin	--	a/ 19,000	--
Total, Working Fund, Agriculture, General	--	19,200	--

a/ Allotment as of December 31, 1950.

(Continued on next page)

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Working Fund, Agriculture, Agricultural Research Administration (Trust Account) Advanced from:			
Reconstruction Finance Corporation:			
For research and survey activities relating to continuing and expanding abaca production in the Western Hemisphere	- -	162,000	- -
Total, Working Funds	252,890	417,778	- -
Miscellaneous Contributed Funds, Department of Agriculture (Bureau of Plant Industry, Soils, and Agricultural Engineering):			
Trust funds deposited by non-federal agencies for cooperative research as follows:			
1. Improvement and management of turf grasses and control of weeds by chemical treatment.	4,001	3,625	2,900
2. Collection of planting material of sugarcane species and varieties for the American sugarcane areas	9	217	- -
3. Investigations on the control of diseases of truck crops .	185	- -	- -
4. Investigations on the production of morphine for medicinal use from the poppy plant.	1,121	- -	- -
5. Floricultural research on new methods of production and propagation	317	55	- -
6. Comparison of methods for accelerated tests of wood decay	5,033	4,000	4,000
7. Production of parent or foundation cotton seed to meet the need of the one-variety program in California	7,488	7,700	7,700
8. Sugar beet storage investigations	2,572	- -	- -
9. Spinach breeding and disease investigations	4,280	5,000	5,000
10. Research on phytotoxicity of insecticides and fungicides.	466	500	500
11. Cooperative hybrid onion research	10	3	- -
12. Salt-meal feeding investigations	2,293	4,600	4,600
Total, Miscellaneous Contributed Funds	27,775	25,700	24,700

(Continued on next page)

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Expenses, International Development, Executive Office of the President (Allotment to Agriculture) (Bureau of Plant Industry, Soils, and Agricultural Engineering):			
Investigations directed toward the development of rubber production in the Western Hemisphere	346,935	a/ 211,500	- -
TOTAL, OBLIGATIONS UNDER ALLOTMENTS, WORKING FUNDS, AND TRUST FUNDS	1,238,107	1,296,478	628,600

a/ Allotment as of December 31, 1950.

PASSENGER MOTOR VEHICLES

Replacements. The 1951 estimates contemplate the replacement of 28 automobiles at a unit cost of $1,000 each, which represents approximately 13 per cent of the total number owned and operated.

Each of the cars to be replaced will be six or more years old or will have accumulated mileage of over 60,000 miles at the time of disposal. When replaced, it is estimated that they will average 12 years of service and will have been driven an average of approximately 70,000 miles. Cars are essential for use by research workers where other means of transportation are inadequate or not available. The average age and mileage of the cars to be replaced are considerably above an efficient operating level and replacements should be made as soon as possible. There has been no change in the research program of the Bureau which would permit reducing the size of the fleet.

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

Purpose Statement

The Bureau of Entomology and Plant Quarantine as now established was formed in 1934 by consolidation of two existing bureaus and by adding certain functions previously carried on by other agencies of the Department. Federal research in entomology goes back to 1854. In 1878, a Division of Entomology was established in the Department of Agriculture, and in 1904 a Bureau of Entomology was organized.

The Bureau is authorized to perform the following activities:

1. Study the distribution, abundance, host plant relationships, life history, and habits of insects which are injurious or beneficial to agriculture and forestry, with a view to developing practical methods for destroying the harmful ones and promoting the increase and spread of the beneficial ones.

2. Investigate the habits and develop means for control of all insects annoying or affecting the health of man and animals, infesting human habitations, or injurious to industries.

3. Conduct chemical investigations to develop new insecticides and conduct research to improve methods and equipment for their application.

4. Enforce quarantines and restrictive orders to prevent the entry into the United States of dangerous plant pests and to regulate the importation of nursery stock, fruits, vegetables, cotton, and other plants and plant products likely to carry pests.

5. Apply control measures directed at eradication, suppression or prevention of spread of insect pests and plant diseases in cooperation with Federal, State and local agencies, private organizations, and in certain instances with the governments of Canada and Mexico.

6. Enforce plant quarantines to prevent the spread of plant pests which have gained a limited foothold, cooperating with States in these activities.

7. Inspect and certify as to freedom from injurious pests and plant diseases plants and plant products intended for export, in order to meet the sanitary requirements of the countries to which shipments are consigned.

The work of the Bureau on insect investigations is carried on in cooperation with state colleges, agricultural experiment stations, other agencies of the Federal govenment, associations, commercial growers, livestock owners and beekeepers. The Bureau cooperates with States and local agencies in combatting insects and plant diseases, and in surveys to detect incipient and emergency outbreaks of insects and plant diseases.

The Bureau of Entomology and Plant Quarantine maintains its headquarters at Washington, D. C. with approximately 491 laboratories or stations located throughout the United States and in Alaska, Hawaii, Puerto Rico, the Canal Zone, Mexico, France, and Egypt. The Bureau as of November 30, 1950, had a total of 2,450 full-time employees, 235 of whom were in Washington, and the balance in the field, and 275 part-time employees, employed during the active season of the respective programs, including those engaged in work on the control of forest pests. This latter activity is described in a separate section of these notes.

	Estimated, 1951	Budget estimate, 1952
Appropriated funds:		
Salaries and expenses	$11,284,300	$11,335,000
Control of Emergency Outbreaks of Insects and Plant Diseases	a/ 2,545,760	2,063,000
Total appropriated funds	$13,830,060	13,398,000

a/ Includes $445,760 available from prior year balance.

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

Summary of Appropriations, 1951 and Estimates, 1952

Item	Total Anticipated available, 1951 a/	Budget estimates, 1952	Increase (+) or Decrease (-)
Salaries and Expenses:			
Insect Investigations	$4,061,300	$3,908,000	-$153,300
Insect and Plant Disease Control	4,834,500	4,760,000	-74,500
Plant Quarantines	2,388,500	2,667,000	+278,500
Total, Salaries and Expenses	11,284,300	11,335,000	+50,700
Control of Emergency Outbreaks of Insects and Plant Diseases	b/2,100,000	2,063,000	-37,000
Total, direct annual appropriation or estimate	13,384,300	13,398,000	+13,700

a/ Adjusted for comparability with the appropriation structure proposed in the 1952 Budget Estimates.

b/ Excludes prior year balances available in the amount of $445,760.

(a) Salaries and Expenses

	Insect Investigations	Insect and Plant Disease Control	Plant Quarantines	Total
Appropriation Act, 1951 ..	$4,157,500	$4,450,000	$2,354,700	$10,962,200
Reduction pursuant to Section 1214	-45,500	-104,000	-37,700	-187,200
Activities transferred in 1952 estimates to:				
"Control of communicable diseases, Public Health Service" for investigations and studies of effects of insecticidal and fungicidal residue on human health	-50,000	- -	- -	-50,000
"Salaries and expenses, Office of Information" for distribution of motion pictures	-700	- -	- -	-700
Activities transferred in 1952 estimates from:				
"Control of Forest Pests" for gypsy and brown-tail moth control	- -	+560,000	- -	+560,000
"Insect and plant disease control" to "Plant quarantines" for transit inspection work	- -	-71,500	+71,500	- -
Base for 1952	4,061,300	4,834,500	2,388,500	11,284,300
Budget Estimate, 1952	3,908,000	4,760,000	2,667,000	11,335,000
Net increase	-153,300	-74,500	+278,500	+50,700

SUMMARY OF INCREASES AND DECREASES, 1952

Insect investigations:	
Decrease in funds for research on oriental fruitfly in Hawaii, including search for parasites	-$150,000
For investigations to determine if insects are carriers of oak wilt and to develop effective and economical control methods for any insects proved to be carriers	+15,000
Decrease due to providing a direct appropriation to the General Services Administration for certain procurement and leasing costs previously paid from this appropriation	-18,300
Subtotal	-153,300
Insect and plant disease control:	
Reduction in funds for Hall scale eradication	-25,000
Decrease due to elimination of non-recurring item provided in the 1951 Appropriation Act for purchase of office building at Greenfield, Massachusetts	-23,500
Decrease due to providing a direct appropriation to the General Services Administration for certain procurement and leasing costs previously paid from this appropriation	-26,000
Subtotal	-74,500
Plant quarantines:	
To strengthen port inspection work to prevent entry of the golden nematode, citrus blackfly, and oriental fruitfly into the continental United States and to safeguard against the entry of foreign pests into Guam and the Virgin Islands and the spread of pests from these areas to the mainland of the United States	+250,000
To strengthen transit inspection of materials subject to Federal plant quarantines	+35,200
Decrease due to providing a direct appropriation to the General Services Administration for certain procurement and leasing costs previously paid from this appropriation	-6,700
Subtotal	+278,500

PROJECT STATEMENT

Project	1950	1951 (estimated)	Increase or decrease: GSA adjustment	Increase or decrease: Other	1952 (estimated)
1. Insect investigations:					
a. Insects affecting food, feed, and fiber crops	$2,647,138	$2,672,400	-$17,400	-$150,000(1)	$2,505,000
(1) Fruit insects	(451,791)	(467,400)	(-3,600)	(- -)	(463,800)
(2) Fruitflies, except oriental fruitfly	(57,461)	(57,300)	(- -)	(- -)	(57,300)
(3) Citrus blackfly	(89,549)	(94,800)	(- -)	(- -)	(94,800)
(4) Oriental fruitfly	(476,026)	(486,200)	(-300)	(-150,000)	(335,900)
(5) Truck crop and garden insects	(504,164)	(506,500)	(-10,700)	(- -)	(495,800)
(6) Cereal and forage insects	(583,729)	(582,200)	(-1,300)	(- -)	(580,900)
(7) Cotton insects	(264,252)	(259,700)	(-1,300)	(- -)	(258,400)
(8) Bee culture	(220,166)	(218,300)	(-200)	(- -)	(218,100)
b. Insects affecting forests and forest products	519,825	501,800	-300	+15,000(2)	516,500
c. Insects affecting man and animals	276,760	289,300	-200	- -	289,100
d. Plant pest control investigations	580,982	597,800	-400	- -	597,400
(1) Insect pest survey	(9,879)	(10,100)	(- -)	(- -)	(10,100)
(2) Identification and classification of insects	(162,486)	(169,500)	(-100)	(- -)	(169,400)
(3) Foreign parasites	(38,009)	(37,400)	(- -)	(- -)	(37,400)
(4) Control investigations	(133,959)	(133,100)	(-100)	(- -)	(133,000)
(5) Insecticide and fungicide	(236,649)	(247,700)	(-200)	(- -)	(247,500)
Subtotal	4,024,705	4,061,300	-18,300	-135,000	3,908,000

(Continued on next page)

Project	1950	1951 (estimated)	Increase or decrease: GSA adjustment	Increase or decrease: Other	1952 (estimated)
2. Insect and plant disease control:					
a. Japanese beetle control	507,443	496,300	-8,900	- -	487,400
b. Sweetpotato weevil control ..	231,399	225,900	-200	- -	225,700
c. Mexican fruitfly control	199,871	200,000	-200	- -	199,800
d. Phony peach and peach mosaic eradication	156,845	154,900	-1,200	- -	153,700
e. Barberry eradication	693,577	681,300	-700	- -	680,600
f. Pink bollworm and Thurberia weevil control ..	1,201,159	1,204,000	-8,800	- -	1,195,200
g. Golden nematode control	435,041	397,800	-400	- -	397,400
h. Citrus blackfly control	93,402	97,100	-100	- -	97,000
i. White fringed beetle control ..	855,154	712,500	-5,100	- -	707,400
j. Hall scale eradication	127,912	104,700	-100	-25,000(3)	79,600
k. Gypsy and brown-tail moth control	569,547	560,000	-300	-23,500(4)	536,200
Subtotal	5,071,350	4,834,500	-26,000	-48,500	4,760,000
3. Plant quarantines:					
a. Plant quarantines	2,381,597	2,388,500	-6,700	+285,200(5)	2,667,000
(1) Foreign plant quarantines	(2,312,271)	(2,317,000)	(-6,700)	(+250,000)	(2,560,300)
(2) Transit inspection	(69,326)	(71,500)	(- -)	(+35,200)	(106,700)
Subtotal	2,381,597	2,388,500	-6,700	+285,200	2,667,000
Unobligated balance	142,802	- -	- -	- -	- -
Total available..	11,620,454	11,284,300	-51,000	+101,700	11,335,000

(Continued on next page)

Project	1950	1951 (estimated)
Transferred in 1952 Estimates to:		
"Control of Communicable diseases, Public Health Service"	- -	+50,000
"Salaries and expenses, Office of Information, Department of Agriculture"	+652	+700
Transfer in 1952 Estimates from:		
"Control of Forest Pests, Department of Agriculture" ..	-569,547	-560,000
Transfer in 1951 Estimates from:		
"Research and Marketing Act of 1946, Department of Agriculture".	-476,572	- -
"Special research fund, Department of Agriculture".	-10,621	- -
"Control of Emergency Outbreaks of Insects and Plant Diseases".	-983,066	- -
Reduction pursuant to Section 1214 ..	- -	+187,200
Total appropriation or estimate	9,581,300	10,962,200

INCREASES AND DECREASES

Insect Investigations:

(1) A decrease of $150,000 under the project "Insects Affecting Food, Feed, and Fiber Crops" for oriental fruitfly research in Hawaii.

Most of the areas of the world likely to yield important natural enemies of fruit flies will have been explored by the end of the fiscal year 1951 and the explorations to collect and import natural enemies of the oriental fruitfly and associated receiving work in Hawaii can be curtailed. Certain phases of the studies to determine host relationships, responses to environment which are part of the biological research program will have been reasonably well completed and can be continued at reduced cost. Equipment required for certain lines of research work has also been secured,

which will permit some reduction in expenditures and the cost associated with large scale tests of control measures is expected to be less in the next fiscal year.

For continuing research on methods for control or eradication of the oriental fruitfly in Hawaii and for protection of the mainland in event of further spread, the estimates include for 1952 the sum of $335,900.

(2) An increase of $15,000 under the project "Insects Affecting Forests and Forest Products" to determine if insects are carriers of oak wilt and to develop effective and economical control methods for any insects proved to be carriers.

Need for Increase: Oak wilt is a disease caused by the fungus, *Chalara quercina*. It attacks and is destructive to the more important timber-producing species of oaks in the eastern sections of the United States. Approximately one-third of the hardwood sawtimber produced in this region is from these species. The destruction of oak timber resources and of oaks as shade and ornamental trees would be an irretrievable loss.

Prior to 1950 oak wilt was known to occur in Illinois, southern Wisconsin, southern Minnesota and in practically all of Iowa. During 1950 it was found to be widely distributed in Missouri and to be present in southern Nebraska, northern Arkansas, northwestern Indiana and northeastern Ohio. These recent extensions of known areas of distribution place it in the great oak timber region of the Ozarks and in areas of different climatic influences where its rate of spread may be intensified.

Purpose: Insects are suspected as carriers of oak wilt from diseased to healthy trees. The purpose of this work would be to determine if the fungus responsible for oak wilt is transmitted by one or more species of insects and to determine possibilities of economical control of any such insect species as are proved to be carriers.

Plan of Work: Studies to determine if insects are serving as vectors of oak wilt and to identify the species responsible would be conducted in close cooperation with the Division of Forest Pathology of the Bureau of Plant Industry, Soils, and Agricultural Engineering. Initial efforts would consist of surveying oak stands in diseased areas to determine the insect species that feed on these trees and that might serve as vectors; to determine the frequency of their occurrence and relative abundance in an effort to determine priority in tests of transmission of the fungus; to collect and test under controlled conditions species considered as likely vector-suspects; to determine the distribution, life histories, and habits of any and all insect species that are found to transmit the fungus; and to develop effective and economical methods of control.

Headquarters for conducting these studies would be at Columbia, Missouri, where investigations by the Division of Forest Pathology on oak wilt are already under way and for which an increase is also reflected in the estimates.

Insect and Plant Disease Control:

(3) A decrease of $25,000 for "Hall Scale Eradication"

Inspections to detect this introduced scale have failed to disclose infestation in areas other than two locations in California and it is therefore proposed to curtail these activities in fiscal year 1952. By the end of the current fiscal year the number of trees that have to be fumigated and intensively inspected will be reduced and the volume of fumigation and intensive inspection will decrease. To attain the goal of this cooperative eradication project it is, however, essential that the required inspection and treatment program be continued until all hosts in the infested area have been fumigated and intensively examined to assure that the scale has been eradicated. The proposed reduction is the maximum that can be made at this time. Unless unforseen developments occur it is expected the work load and cost will continue to decrease and the project successfully terminated.

(4) A decrease of $23,500 due to elimination of non-recurring item included in the 1951 Appropriation Act for purchase of an office building at Greenfield, Massachusetts.

Acquisition of this building, in which the Division of Gypsy Moth Control occupied rented space, has enabled the Bureau to bring to Greenfield other units of its organization. Personnel engaged in blister rust control were moved from Cambridge, Massachusetts, and other personnel assigned to quarantine enforcement against the gypsy moth and Japanese beetle were shifted from East Orange, New Jersey. This consolidation of activities promises more efficient and economical operations.

Plant Quarantines:

(5) An increase of $285,200 under this project composed of:

(a) Increase of $250,000 to strengthen port inspection work to prevent entry of the golden nematode, citrus blackfly, and oriental fruitfly into the continental United States and to safeguard against the entry of foreign pests into Guam and the Virgin Islands and the spread of pests from these areas to the mainland of the United States.

Need for Increase: The threat of invasion by the golden nematode, citrus blackfly, and oriental fruitfly has increased to the point that present inspection staffs at strategic ports of entry are inadequate to protect American agriculture from those pests. The Plant Quarantine Act requires the Department to provide plant quarantine protection to such dependencies as Guam and the Virgin Islands. Work in Guam, provided for during recent years under funds made available by the Navy, will be terminated at the end of the present fiscal year. These activities need to be continued and similar plant quarantine protection extended to the Virgin Islands. These important needs are discussed briefly in the following paragraphs:

1. The golden nematode. The golden nematode, which presently infests a limited area on Long Island, New York, is a destructive pest of potatoes and tomatoes. It forms a minute cyst which remains viable for years and may be carried in very small quantities of soil associated with many kinds of plants and even with such materials as cordage, straw packing, and other miscellaneous products which have until recently been thought to present little or no hazard as a means of entry of destructive plant pests. The minute cysts of this pest are being intercepted with alarming frequency in soil with a wide variety of imported products destined to points throughout the United States. Detecting these cysts requires very close inspection and the use of special, exacting, and time-consuming techniques, and presents one of the most difficult problems ever to confront plant quarantine officials. The golden nematode is known to occur in a number of European countries which carry on extensive commerce with the United States, which increases the likelihood of its gaining entry through ports on the Atlantic Coast and certain ports on the Gulf of Mexico.

   The detailed inspections needed on account of this pest and the supervision of procedures needed to safeguard importations found to be infested have added greatly to the work load at several ports--particularly Boston and New York--because of the volume and variety of importations from infested countries. Air and surface traffic from Europe is so heavy that it is not now possible to cover all phases of plant quarantine work with the limited staffs available. Inspectors give first attention to commodities and shipments where the pest risk is believed to be the greatest, but facilities are inadequate to cover many important avenues for pest entry which require close attention of trained personnel. Similar conditions occur at ports on the Gulf Coast where the inspection work load has been materially increased by the necessity of inspecting and providing for safe disposition of products likely to carry the golden nematode.

2. The citrus blackfly. The citrus blackfly is established in extensive areas of eastern and western Mexico and heavy infestations occur close to the American border. About 8,500,000 vehicles a year cross the border from Mexico. Many of these pass through the heavily infested areas only a few hours before reaching the border and proceed directly into the important citrus zone of the Lower Rio Grande Valley of Texas. It is necessary to make thorough examination of these vehicles to assure that they do not carry any of the 140 different host plants of the citrus blackfly in Mexico which might be the means of bringing the pest into this country. Infested plant material not intercepted at the time of entry could also be transported to the citrus production areas of Arizona, California, and Florida within

a matter of hours. The ports of Brownsville, Hidalgo, and Laredo, Texas and Nogales, Arizona are critical points in the defense line against the invasion of the citrus blackfly since they are connected with the heavily infested areas in Mexico by paved highways. The ports of Eagle Pass and El Paso are also situated on highways into the interior of Mexico, and heavy traffic through those ports has accentuated the need for increased inspection to prevent the entry of this insect. In addition, articles carried by passengers or as cargo on ships entering at maritime ports on the Gulf and Atlantic Coasts constitute a definite hazard. Infested material has arrived at these ports and fuller inspection is needed to give more adequate protection from this pest. With the amount of increase in inspection time to handle the accelerated traffic going through these ports it is impossible to make the thorough inspection which is deemed necessary to adequately protect this country from this serious pest. These factors will continue and it is expected will increase in 1952; it is therefore essential that additional staff be placed at these ports to properly render this inspection service in an adequate manner to prevent the entry into this country of these serious plant pests.

3. The oriental fruitfly. The potential hazard of the destructive oriental fruitfly to the economy of California, Florida, and other Southern States has been demonstrated by its depredations in Hawaii where it attacks more than 100 fruits and vegetables, including the most important crops of the Islands. The destruction it has caused there and the hazard it presents to the mainland emphasize the importance of preventing similar introduction of the pest elsewhere. Aircraft flights from Hawaii to the mainland are a constant threat of infestation. The pest is frequently intercepted in host material destined to the mainland and only by effective preflight inspection and treatment of all aircraft prior to departure can the pest be kept out of the continental United States. Infested host material is also found in mail being dispatched to the mainland. To provide completely effective clearance of both aircraft and mail to prevent spread of the oriental fruitfly to the continental United States it is essential that the staff in Hawaii be adequate to prevent any escape from there. The rapidity with which the oriental fruitfly became established in Hawaii indicates that should it be introduced into other countries, especially those in the southern part of the Western Hemisphere, further spread would be uncontrolled. The possibility of this pest being established in such new areas emphasizes the need for technically qualified personnel at Gulf Coast ports. Due to the international situation traffic has doubled. The size of aircraft, number of passengers, and amount of cargo have greatly increased, thereby also increasing the time consumed in inspection. Experience of the last war and subsequent expansion support the belief such increases will continue in 1952, and will require additional staff to adequately meet this situation.

4. Guam and the Virgin Islands of the United States. Because of increased traffic from the Orient, particularly by air, Guam has assumed major importance in the national plant quarantine program. There is a definite risk of pests such as fruitflies spreading to Hawaii and the continental United States unless plant quarantine services are provided. It is also important that this work be continued to protect the agriculture of Guam. Since the fiscal year 1949 plant quarantine work in Guam has been carried on by a representative of the Bureau under funds provided by the Navy. This arrangement will be terminated at the end of the current fiscal year. To continue the program will require funds to provide for salaries of inspectors and operating expenses.

At the present time the Virgin Islands of the United States are without plant quarantine protection against foreign pests, nor is there protection against the movement of fruitflies and other serious pests of these Islands to the mainland. Because of the urgent need for such protection it is planned to hold a public hearing in the near future and take necessary steps to promulgate plant quarantine regulations applicable to the Islands. These matters have been considered with appropriate officials of the Virgin Islands and the Department of the Interior. To provide essential protection it will be necessary to station inspectors on St. Croix and St. Thomas, establish and equip small offices in each of those places and provide for operating expenses.

Plan of Work: To effectuate the needed additional protection against the entry of pests such as the golden nematode, citrus blackfly, and oriental fruitfly it is proposed to strengthen the staffs of the specific ports mentioned and others where the volume and character of traffic from known areas of infestations of those pests present unusual hazard and special detailed inspection problems. To provide plant quarantine protection to Guam and the Virgin Islands and for the protection to the mainland from movement of pests established in these districts it is proposed to station inspectors on these islands.

(b) Increase of $35,200 for inspection in transit of materials subject to Federal plant quarantines.

Need for Increase: The importance of transit inspection as a second line of defense in the enforcement of Federal plant quarantines has been fully demonstrated. An average of more than 2,000 shipments consigned in violation of Federal domestic plant quarantines are intercepted annually. Such interceptions have included plants infected by white pine blister rust and infested by insects such as gypsy moth, Japanese beetles, and white-fringed beetles. Funds now available are sufficient only to provide inspection at some of the more important distribution centers through which shipments by

railroad of parcel post, express, and freight are consigned and where they are available for inspection. This work should be expanded (1) to strengthen inspection at major centers, (2) to provide service at some distribution points at which no inspection is maintained, (3) to provide inspection at airports and truck transportation distributing centers to safeguard these rapidly expanding means of transportation.

Plan of Work: The increase would provide (1) year-around inspection at important transportation centers now operated seasonally such as Atlanta and Memphis; (2) additional manpower at centers such as St. Louis, Chicago and New York; (3) inspection at points not now operated such as Omaha, Council Bluffs, and New Orleans. Adequate manning of such stations would permit more effective integration of foreign and domestic plant quarantine enforcement than is possible with available funds.

State cooperation in this activity approximates $53,000 annually. Transportation companies also cooperate by segregating and holding for inspection shipments which they know contain materials subject to the restriction of Federal plant quarantines. The cash value of this cooperation cannot be estimated. However, it involves cooperation on the part of many thousand individuals.

CHANGES IN LANGUAGE

The estimates include proposed changes in the language of this item as follows (new language underscored, deleted matter enclosed with brackets):

Preamble

* * * authorizing the eradication, control, and prevention of spread of injurious insects and plant pests; including the operation and maintenance of airplanes and the purchase of
1 not to exceed [two] three, * * *

* * * and the amounts obligated for contract research shall
2 remain available until expended [: Provided further, That $50,000 shall be transferred to applicable appropriations of the Public Health Service for investigations and studies of effects of insecticidal and fungicidal residue on human health].

* * * For carrying out operations or measures to eradicate, suppress, control, or to prevent or retard the spread of Japanese beetle, * * * white-fringed beetle, [and the] Hall
3 scale, and gypsy and brown-tail moths, including the enforcement of quarantine regulations * * * and for cooperation with States in the compensation of growers for losses resulting from the destruction of or for not planting potatoes and tomatoes on lands infested or exposed to infestations of the golden nematode for the purpose authorized by the Golden Nematode Act (Public Law 645, approved June 15, 1948),

4 [and for the enforcement of domestic plant quarantines through inspection in transit, including the interception and disposition of materials found to have been transported interstate in violation of Federal plant quarantine laws or regulations, and operations under the Terminal Inspection Act (7 U.S.C. 166), $4,450,000] $4,760,000: * * *

5 [Foreign plant] Plant quarantines: For operations against the introduction * * * for enforcement of domestic-plant
6 quarantines as they pertain to Territories and districts
7 of the United States, for the enforcement of plant quarantines through inspection in transit, including the interception and disposition of materials found to have been transported in violation of Federal plant quarantine laws or regulations, and operations under the Terminal Inspection Act (7 U.S.C. 166) and enforcement of regulations governing the movement of plants * * *

The first change in language, increasing the authority under this item for the purchase of airplanes from two to three is in accordance with the proposed transfer in the 1952 estimates to this appropriation of the gypsy and brown-tail moth activities previously carried under the appropriation "Control of Forest Pests". The Budget estimates propose a comparable reduction in the number of airplanes to be purchased under that appropriation item.

The second change in language, which proposes deletion of provision for transfer of funds to the Public Health Service for investigaions and studies of effects of insecticidal and fungicidal residue on human health, is in accordance with the proposed transfer in the 1952 estimates of this work from the subappropriation "Insect Investigations" to the appropriation "Control of Communicable Diseases, Public Health Service".

The third change in language is proposed to include provision under this appropriation to carry out operations to combat gypsy and brown-tail moths in accordance with the proposed transfer in the 1952 estimates of gypsy and brown-tail moth activities to this appropriation item from the appropriation "Control of Forest Pests". This change is proposed for the sole purpose of simplifying the appropriation structure and administration of the Bureau, and will in no way affect the nature or scope of the work being conducted.

The fourth and seventh changes in language are proposed in accordance with the proposed transfer in the 1952 estimates of transit inspection activities from the subappropriation "Insect and Plant Disease Control," to the subappropriation "Plant quarantines." This transfer in the estimates is proposed for the sole purpose of simplifying the administration of the Bureau. The activities associated with the enforcement of the several plant quarantines which are concerned primarily with movement within the mainland, with domestic plant quarantines governing movement of regulated articles between the territories and districts of the United States and the mainland, and with foreign plant quarantines have much in common and in some locations may involve contacts with the same agencies.

The fifth change in language is proposed to delete "Foreign plant" and substitute "Plant" in the title of the third subappropriation under this item, so that the new title will read "Plant Quarantines". This change is proposed solely in order that the title may reflect the full scope of the work under this subappropriation item including the transit inspection activities, which are proposed for transfer to this item in the 1952 estimates.

The sixth change is proposed to specifically indicate that areas of the United States referred to as "districts" such as the island of Guam and the Mandated Islands, which from the standpoint of plant quarantines have the same general status as "territories" may be treated comparably with territories.

STATUS OF PROGRAM

INSECT INVESTIGATIONS

Current Activities include studies on the distribution, abundance, host relationships, life history, habits, and methods of control of insects and the development of means for the utilization of natural enemies for the control of insect pests, including the importation of natural enemies of introduced pests which are injurious to agriculture and forestry. The work is carried on, through field tests and laboratory experiments, in practically every state, in Hawaii, Puerto Rico, Panama, and Mexico, and headquarters for foreign parasite work are maintained in France. Most of the activities involve cooperation with state colleges, agricultural experiment stations, other agencies of the Federal government, associations, commercial growers, livestock owners and beekeepers.

Insect pests affect all phases of agriculture, and are important problems in many industrial activities and in the home. The importance of a strong continuing research program to develop improved control methods is emphasized by the fact that losses inflicted by insect pests approximate four billion dollars annually.

Research objectives include the following general purposes:

1. To develop means whereby the growers of fruits, nuts, truck and garden crops, cereal, forage and range crops, cotton, tobacco, sugar plants and other agricultural products, can control insect pests more effectively or more economically, thus increasing the net returns from their operations and insuring an ample supply of high-quality agricultural products.

2. To devise the most effective and economical means of preventing or controlling insect damage to forest and shade trees, forest products and shrubs.

3. To devise and improve methods of utilization of the honey bee for the production of honey and wax, and for the pollination of crops.

4. To develop control measures for those insects which transmit disease, annoy man, and attack livestock.

5. To devise the most effective and economical means of preventing or controlling insect damage to stored agricultural products, foods and fabrics.

6. To identify insects and allied organisms for the quarantine, control and research activities of the Bureau and for other Federal and State agencies, farmers, pest control operators, and other private individuals of the United States, as well as for foreign institutions; and to collect, maintain, and furnish information as to the presence and abundance of insect pests.

7. To develop methods and apparatus for freeing commodities of pests under plant quarantine regulations so that they can move freely and safely in commerce.

8. To improve the chemical materials now employed in controlling insects, to develop new and better chemical materials and to devise improved apparatus and methods for their application.

Examples of Recent Progress and Trends

Insects Affecting Food, Feed, and Fiber Crops

Fruit Insects, Including Fruitflies:

1. Mites continue as number one pest in orchards. Few of the new insecticides have been found equally effective against all kinds of mites in deciduous orchards. Parathion continues to be outstanding for this purpose, largely because it is highly effective against all species. However, a serious hazard to the operator is involved in its use and a safer, effective material is much needed. Several new products appear extremely promising, particularly DMC (1, 1-bis (p-chlorophenylethanol)), EPN (ethyl p-nitrophenyl thionobenzene phosphonate) and Aramite (Bchloroethyl-B-(p-tert.-butyl phenoxy)-alpha-methyl ethyl sulfite).

2. Parathion wettable powder sprays proved equal to the usual oil spray in control of the purple scale on oranges and advanced fruit maturity in Florida experiments. The effect of parathion on the quality of fruit is of considerable interest to citrus growers since it may help to solve the problem of how to get better quality into Hamlin oranges to permit marketing them earlier. The indicated effectiveness of parathion against scale insects also provides a means of avoiding retarded maturity, which is a problem following late oil spray applications.

3. DDT applied by airplane was effective in preventing Japanese beetle injury to corn in field tests conducted in Virginia and Pennsylvania. As little as 1 pound of DDT per acre in an emulsion or 1½ pounds in a dust formulation gave reasonably good control. Dust applications lacked the lasting effectiveness of the emulsions. Since DDT cannot be used on corn to be fed to milking cattle or animals soon to be slaughtered, work is being continued to find a material that will control the Japanese beetle on corn without leaving a residue that is considered harmful. The Japanese beetle injures corn by destroying the developing silk, thus preventing pollination.

4. Insect carriers of stone fruit virus diseases incriminated in Pacific Northwest. A leafhopper was proved to transmit the virus that causes X disease of peach in western United States. This was found in cooperative experiments with the Bureau of Plant Industry, Soils, and Agricultural Engineering and the Agricultural Experiment Stations of Utah, Washington and Oregon. Tests are being continued to determine the presence of additional insects that may carry diseases.

5. Citrus Blackfly. Many of the newer insecticides have been tested to determine their effectiveness. Some of the more promising ones cannot be used under conditions in Mexico. A light medium horticultural spray oil and cube root is being used in the generally infested area and has given good commercial control of the pest. Sprays containing DDT in xylene and kerosene are also fairly effective.

6. Expanded Oriental fruitfly research shows progress. The purpose of this research is to obtain information that would form the basis of any program of control or eradication should this fruitfly be found in the continental United States. Although much of the work is intended primarily for the benefit of mainland agriculture, the investigations are also of great benefit to Hawaiian growers. Cooperating agencies include the agricultural experiment stations of Hawaii and California, the California Department of Agriculture, the Hawaiian Board of Commissioners of Agriculture and Forestry, the Pineapple Research Institute, and the Hawaiian Sugar Planters Association. Among the numerous new insecticides tested, EPN, dieldrin, parathion and DDT seemed to be the most effective in residual sprays. In fog sprays, dieldrin, aldrin, chlordane, and lindane were effective, but the flies present laid some eggs before the poisons took effect. Methyl eugenol has been found to be a remarkable lure for male flies, but doesn't attract the females. In 4 months nearly 2 million male flies were captured in 30 glass traps.

The cooperative study of natural enemies has continued. During the past year about 70,000 adults of 36 species of parasites were reared from 162 shipments containing 767,000 fly puparia collected in 8 tropical countries. Six species have been liberated in the field; two of them are well established and show great promise as control agents.

Truck Crop and Garden Insects:

1. Several insecticides shown to be effective against the pea weevil. In field plot experiments in Idaho it was demonstrated that dust mixtures containing 5 percent of methoxychlor, chlordane, toxaphene, aldrin, or dieldrin, or 1 percent of parathion when applied at the same rate per acre, differed little in their effectiveness in the control of the pea weevil

compared to a dust mixture containing 5 percent of DDT, now being widely and successfully used in combating this insect. Methoxychlor seems to be the most promising insecticide for general use as a substitute for DDT because of its relatively low toxicity to warm-blooded animals.

2. Chlordane and aldrin promising for seed-corn maggot control on beans. Progress was made in the control of the seed-corn maggot on beans in southern California. Solutions containing chlordane or aldrin gave promising control of this pest when applied simultaneously to the bean seed and to the surrounding soil, during the planting process, by means of a specially-designed device attached to the rear of the bean-planter boot.

3. An improved aerosol developed for greenhouse pests. An aerosol containing tetraethyl dithiopyrophosphate with methyl chloride as the propellent gas has proved very effective against spider mites, aphids, whiteflies, and mealybugs, and relatively safe for use on tender plants, during the course of experiments conducted in greenhouses at Beltsville, Maryland, and in commercial greenhouses.

Cereal and Forage Insects:

1. Corn earworm profitably controlled with insecticides. Wide commercial use has been made of the DDT oil emulsion spray method developed by the Bureau in cooperation with the Texas, Mississippi and Florida agricultural experiment stations for control of the earworm in market sweet corn. Hundreds of carloads of clean sweet corn for the early Northern markets are now produced in the South where production of this crop formerly was substantially prevented by heavy earworm infestations.

2. Insecticidal control of European corn borer successful. DDT and ryania sprays and dusts developed largely by the Bureau have come into wide use in control of the European corn borer in field and sweet corn. Over a million acres of field corn were treated in 1949 to control the heavy infestations in the Corn Belt States, with an estimated average increase of 10 bushels per acre. The Bureau also helped 14 States provide their farmers with information on the proper timing and use of insecticides to control the corn borer.

3. Grasshopper control much improved with new insecticides. Chlordane and toxaphene continue to be very effective in grasshopper baits, sprays, and dusts, and have been used extensively in large-scale control operations. Recent experiments indicate the possibility of obtaining equally good or better reductions of grasshoppers with aldrin and several other new insecticides applied in sprays at such low dosages that their use, if proved practicable, will decrease the cost of control appreciably.

4. Parathion effective against greenbug. Research in cooperation with the North Dakota and Oklahoma experiment stations established that parathion was the most effective available insecticide for control of the greenbug in small grains. It was recommended for use in either sprays or dusts applied with power equipment only. An estimated half-million acres of infested grain in Oklahoma and large acreages in Texas and Kansas were treated with it in 1950, with good results.

Cotton Insects:

1. Chemical Defoliation Controls the Boll Weevil. Investigations have shown that the boll weevil moves out of the cotton fields rapidly following defoliation in the late summer or early fall thus eliminating most of the damage to locks and bolls late in the season. Most of the fields that are defoliated early in the fall are free of weevils the following spring.

2. Sprays for boll weevil control. For thirty years calcium arsenate dust was the most effective insecticide available for boll weevil control. The new organic insecticides have brought about a notable change as they are equally effective when applied in dust or liquid formulations. The liquid sprays have certain advantages and are rapidly replacing the dusts in many areas.

3. Combination insecticides for control of the boll weevil and other insects. Much progress has been made in developing insecticide combinations that will control the boll weevil and other insects at the same time. Widely used mixtures based on Bureau research include: benzene hexachloride with DDT and sulfur and with special low-lime calcium arsenate; calcium arsenate with nicotine, and with sulfur; and toxaphene with sulfur.

4. Insecticide tests in plots or fields for bollworm and pink bollworm control. Many tests and extensive use by farmers indicate that the dust mixtures now known to be most effective against the bollworm are those containing: (1) 10% DDT; (2) 5% of DDT plus benzene hexachloride (2% gamma isomer), (3) 10% of DDT plus benzene hexachloride (2% gamma isomer), or (4) 20% of toxaphene. A spray that is equal to dusts for bollworm control consists of 2 pounds of toxaphene and 1 pound of DDT per acre when applied at the rate of 7 gallons per acre. DDT ranks first among the insecticides for pink bollworm control. It may be used either as a dust or a spray.

Bee Culture:

1. Selected Stock of Honey Bees Sent Out. Some 1300 hybrid queens were produced and distributed for test purposes in lots of 25 or more to beekeepers throughout the country in connection with the bee breeding project being conducted on Kelley's Island in Lake Erie in cooperation with the Honey Bee Improvement Cooperative Association, a non-profit organization.

2. Many Bees Needed to Produce Alfalfa Seed. An average yield of 896 pounds per acre of recleaned seed was obtained from a run-down alfalfa field of 132 acres on which 5 to 6 colonies of bees per acre had been used for pollinating purposes in an experiment in California conducted in cooperation with State agencies, the owner of the crop and a beekeeper. The state average was 275 pounds. The concentration of bees used in this case was far in excess of the concentration desirable for honey production, one colony per acre being considered the maximum. In the case mentioned the seed grower profited greatly, but the beekeeper did not. Experimental work is proceeding to determine if adequate pollination can be obtained with fewer bees.

Insects Affecting Forests and Forest Products

1. Improvements made in methods and materials used in bark beetle control. Studies to develop cheaper insecticidal formulations for the control of bark beetles indicate that ethylene dibromide and other chemicals may prove generally satisfactory. Their adoption will mean that the transportation of large quantities of oil into remote forested areas will no longer be necessary since local water supplies will suffice in the preparation of emulsion sprays.

2. Research indicates phloem necrosis, a virus disease of elm, may be controlled by spraying with DDT. Phloem necrosis continues to be one of the most destructive tree diseases known. In Ohio selected elm trees were sprayed with an emulsion containing DDT several times each summer since 1945. During the past two years there has been almost no evidence of disease among these trees, while the disease among the unsprayed trees has become epidemic. Recent research findings have disclosed the identity and certain details of the life history and habits of the insect vector of the virus which should aid in its control.

3. White Pine Weevil Control. Experiments conducted in cooperation with the New York Conservation Department show that by the application with a helicopter of two pounds of DDT in two gallons of oil per acre, the population of weevils was so reduced in the sprayed area that practically no signs of their activity were noticeable for two months thereafter, whereas signs of heavy

feeding were characteristic of pines in neighboring unsprayed areas. Final results on the value of this control method will not be available, however, until examinations of the treated plantations are made in the Spring.

4. Dutch elm disease incidence increased in 1950. The Federal laboratory in 1950 provided such identifications for Federal agencies, State governments, municipalities, for arborists and property owners. Dutch elm disease fungus was isolated from 4,723 sets of specimens from 11 states and the District of Columbia. A three-fold increase of disease was found in the District of Columbia and vicinity. Dutch elm disease control by means of DDT sprays on a community-wide basis is being tested at Princeton, N. J. in a plot containing about 2,500 elms.

Insects Affecting Man and Animals

1. Clear Lake Gnats Eliminated. Gnats that formerly plagued residents in the vicinity of Clear Lake, California, appear to have been eliminated by spraying the lake with TDE at the rate of one-part TDE to 70 million parts of water. The application was made in 1949 and no adult gnats were reported in 1950.

2. Improved Pyrethrum Sprays for Controlling Stable Flies and Horn Flies Attacking Livestock. Pyrethrum is one of the most effective and least hazardous of the insecticides used for controlling flies which attack livestock. However, the high cost of the insecticide precludes its widespread use, particularly for fly control on range cattle. The development of pyrethrum stabilizers, however, such as tall oil and p-aminophenol, will lower the cost of pyrethrum insecticides for controlling horn flies and stable flies.

3. Horse Fly and Deer Fly Investigations. Important information has been obtained on the biology and ecology of several species of horse flies and deer flies which are serious pests of cattle and other livestock. New repellents and insecticides are under investigation that appear to be quite effective and more economical than the pyrethrum-piperonyl butoxide sprays, the only effective treatments known to protect animals from attack by the pests.

4. Toxaphene and Lindane-DDT Sprays Recommended for Controlling Livestock Pests. Sprays containing 0.5 percent toxaphene or .025 percent lindane plus 0.5 percent DDT have been recommended to livestock growers for controlling Gulf Coast, lone star, winter and spinose ear ticks, cattle lice, hog lice, goat lice, horn flies and sheep ticks. These new sprays are valuable additions for controlling livestock insects.

5. New Screw-Worm Remedy Developed. Screw-worms cause widespread damage to livestock throughout the Southern United States and in localized areas elsewhere. New treatments have been under investigation and a new smear containing lindane and pine oil that is superior to smear 62 (commonly used) will probably be recommended to livestock growers in 1951.

Plant Pest Control Investigations

Insect Pest Survey:

1. Summaries of the more important insect conditions aid in control. Data provided by cooperating field workers were summarized and issued during the fiscal year 1950 in the form of one annual and 7 monthly statements on insect conditions; 3,500 records of insect occurrence were abstracted and filed; and 9 special supplements to the Insect Pest Survey were issued showing the status during 1949 of pests such as greenbug, European and southwestern corn borers, and hessian fly.

Identification and Classification of Insects:

1. Many government agencies aided by insect identification. About 60,000 insect samples were identified in the fiscal year 1950 for Federal agencies, State agricultural colleges and experiment stations, various other institutions, and individuals.

Foreign Parasites :

1. Citrus Blackfly Parasites Introduced. A search for blackfly parasites in India and Pakistan revealed at least two highly effective species and seven others that may be of value. Shipments of these to Mexico provided 125 colonies for release in infested areas to aid in preventing spread of the pest to the United States.

2. Biological Control of Klamath Weed. Field control of the Klamath weed by the two species of leaf-feeding beetles imported from Australia continues to expand. More than 100 sq. miles in Humbolt County, California, have been cleared of the weed. Colonies of the beetles have been established in all infested counties in California and more recently in infested areas in Oregon, Idaho, Montana and Utah. Two new enemies from Europe, a root borer and gallfly, were colonized this year for the first time.

Control Investigations :

1. Sweetpotatoes treated against the sweetpotato weevil. Recent investigations have developed methods for dusting sweetpotatoes with DDT, thus permitting sweetpotatoes grown in the area infested with sweetpotato weevil to be marketed outside the regulated area during late spring and early summer. In 1950 one and one-half million bushels were marketed from Louisiana alone after April 1. Gains to the grower have been about $2.00 per bushel.

2. White-fringed beetles killed by pyrethrum emulsion. An activated pyrethrum emulsion has been developed that destroys larvae in soil about the roots of coniferous nursery plants. This treatment permits immediate shipment from infested nurseries, whereas the DDT treatment more generally used for other plants involves a waiting period of two seasons before shipment.

Insecticide and Fungicide Investigations:

1. Synthetic Pyrethrum Available Commercially. The method of synthesizing allethrin and other compounds similar to the active constituents of pyrethrum, which was developed by chemists of this Bureau, is now being employed on a commercial scale. This development promises to make this nation independent of foreign sources of pyrethrum, which is an essential material for insect control for both agricultural and military use.

2. Test for Toxaphene. A rapid, simple specific gravity test has been devised for determining accurately on the job the concentration of toxaphene in cattle-dipping vats. It is necessary to maintain the concentration within rather narrow limits to assure good control of cattle ticks without injury to the cattle.

3. Detection of an Insecticide in Plants. A sensitive analytical method has been developed for detecting minute amounts of octamethyl pyrophosphoramide in plant tissues. This systemic insecticidal and some other related compounds have aroused great interest among agriculturists. These compounds, when applied to soil or foliage, are taken up by plants and render them toxic to aphids and mites feeding on them.

4. New Plant Insecticide Discovered. An insecticidal compound has been obtained from the roots of the American weed ox-eye, *Heliopsis scabra*. This compound, which has been named scabrin, is about 2-1/2 times as toxic to houseflies as the pyrethrins. Other species of *Heliopsis* also have been shown to have insecticidal properties.

INSECT AND PLANT DISEASE CONTROL

Current Activities provide for protection of American agriculture from certain destructive insect pests and plant diseases, by conducting, in cooperation with States, operations to control, suppress and prevent spread of these pests and plant diseases.

Among the undertakings now in process, the following are selected as typical:

1. Retarding the spread of the Japanese beetle to non-infested sections of the United States and suppressing infestations in newly located outlying areas. This involves inspection and certification of commodities likely to carry the beetles from the regulated areas, comprising all or parts of the 14 states in northeastern part of the United States.

2. The prevention of spread of the sweetpotato weevil and its eradication from commercial-producing areas. The operations are conducted in cooperation with the States of Alabama, Florida, Georgia, Louisiana, Mississippi, South Carolina, and Texas.

3. The prevention of spread of the Mexican fruitfly from the citrus-producing area of Texas.

4. Suppression and prevention of spread of the phony peach and peach mosaic diseases. These activities are conducted in cooperation with southern states from California to South Carolina.

5. Control of the destructive stem rust disease of wheat, oats, barley, and rye by the eradication of barberries which are the alternate host of the disease. Control work is conducted in 18 grain-growing states.

6. Eradication, suppression, control and prevention of the spread of the pink bollworm from areas where it is now present and prevention of spread of the Thurberia weevil. These operations are carried on in cooperation with all the major cotton-producing States and the Republic of Mexico.

7. Eradication, suppression, control, and prevention of spread of the golden nematode. These operations are carried on in cooperation with the State of New York, particularly in Nassau and Suffolk Counties where the only known infestations in the United States occur. Precautionary surveys are made in other major potato and tomato-producing States.

8. Citrus Blackfly. Control and regulatory activities in connection with the citrus blackfly in Mexico consist of:

   (a) Inspections in Mexico to determine location and intensity of inspections.

   (b) Cooperation with National, State, and local officials in Mexico (1) to control the citrus blackfly and (2) to prevent its spread to uninfested areas. These activities are advisory.

9. Control and prevention of spread of white-fringed beetle. Operations are carried on in cooperation with 8 southeastern states.

10. Eradication of Hall Scale. Activities are conducted in cooperation with the California Department of Agriculture to eliminate this destructive scale insect which is known to occur only in limited areas in that State.

11. The prevention of spread of the gypsy and brown-tail moths. Work is conducted in timberland areas along the western border of the New England section to repel advance to the west and to eradicate progressively to the east.

Examples of Recent Progress and Trends

Japanese Beetle Control:

1. Special treatments of aircraft and airfields curbed the dissemination of Japanese beetle by aircraft. Under project direction, military and commercial airline personnel made 14,800 DDT treatments to aircraft flying from 48 airfields in the heavily infested Japanese beetle area. As a further precaution, beetles were killed by DDT foliage sprays at loading sites or were picked from passengers and cargo going aboard airplanes.

2. Trapping and scouting in selected plant growing areas, at transportation terminals and diversion points, and along highways in 1950 revealed no significant spread of the Japanese beetle to new areas. The cooperation of Bureau field stations, state agencies, and military personnel in western states made it possible to extend the trapping operation nation-wide.

3. Regulated areas extended. In 1950 the quarantine regulated areas in New York, Ohio, Virginia and West Virginia were extended slightly. The North Carolina State quarantine was revised to conform to Federal procedures and to include additional territory. Other states entered into effective quarantine agreements with plant growers to restrict shipments from lightly infested, nonregulated areas. Eighty outlying infestations, found during the year or earlier, received soil or foliage applications of insecticides which relieved the necessity for quarantine action.

4. The principal items certified for movement from infested to non-infested areas during the year were 97,600,000 plants, 22,150 packages of cut flowers, and 5,200 truck and car loads of fresh fruits and vegetables. The value of the regulated products permitted nation-wide movement without contributing to the spread of the Japanese beetle is placed at about $14,600,000.

Sweetpotato Weevil Control:

1. An intensified educational program improved cooperation in eradication efforts by growers and groups of interested individuals. In Texas the eradication work has been expanded to include new areas and the program in Louisiana has been intensified.

2. DDT treatment of sweetpotato table stock from infested farms permits safe marketing over an extended period and is being widely adopted, especially in the heavy-producing areas of Louisiana.

3. Infestations were recently found on 175 farms in 12 counties of Georgia not previously known to be infested and on 31 properties in two Georgia counties in which the weevil was thought to have been eradicated. Two additional counties in northwest Florida, two in Louisiana, and two in Texas were found to be infested. Most of these infestations were traceable to movement of infested table or planting stock contrary to quarantine regulations.

4. Since 1937 weevils have been eliminated from 10,717 farms in th the commercial producing areas where work is under way in Alabama, Florida, Georgia, Louisiana, Mississippi, South Carolina, and Texas. Only 3,319 infested farms remain in such areas. In the heavily infested parish of St. Landry, Louisiana, 244 infested farms remain out of a total of 1,233 found since eradication work was begun there.

Mexican Fruitfly Control:

1. Infestation in the citrus groves in the Rio Grande Valley of Texas required a considerable amount of fruit sterilization although production was less than normal. Grapefruit destined for shipment to areas which might become infested was treated by thervery effective vapor-heat method. The increasing use of this process is annually opening up a wider market and extended the harvesting season for Texas citrus fruit.

Phony Peach and Peach Mosaic Eradication:

1. Nearly 200 trees infected with mosaic were found in the peach-producing area of southwest Arkansas. Action taken to forestall an explosive outbreak characteristic of the peach mosaic disease required corresponding curtailment elsewhere in the over-all program.

2. Environs of more than 400 nurseries growing nearly 8 million peach nursery trees were inspected in and near infected areas in 13 states to insure that the phony peach and peach mosaic diseases would not be distributed in nursery stock. There has been no record of spread of these diseases in nursery trees since this method of nursery protection was devised 15 years ago.

3. Four vectors of the phony disease have been discovered. Experiments to control these are under way. The virus has been discovered in above-ground plant parts as well as in roots. The disease has been found in symptomless form in wild plums. These new factors will be evaluated when the new information is sufficiently complete, with a view to determining any needed changes in control efforts.

Barberry Eradication:

1. About 84 percent of the area in 18 cooperating states is now free of rust-spreading barberry plants. The remaining 168,598 square miles has many barberry-infested sites. It will be necessary to work such areas at intervals of about five years to free them of these bushes. Over 79,000 properties within this area are now or have been infested with barberries. The status of barberry eradication on December 31, 1949 is summarized in Table 2.

   Over 9½ million barberry bushes were destroyed on 3,426 new properties and 2,289 reinfested properties in 214 counties. A total of 6,715 previously infested properties were reinspected and no bushes were found. (See Table 1.)

   Field trials of the chemicals, 2,4-D and 2,4,5-T indicate that these chemicals applied with power equipment may speed up the eradication of native barberry bushes four or five times, and reduce the cost of chemicals by 60 per cent below the cost of those previously used for this work.

Pink Bollworm and Thurberia Weevil Control:

1. Intensive inspections in all regulated areas and general inspections in uninfested sections during the 1949 crop season were carried on in California, Arizona, Texas, Oklahoma, Louisiana, Mississippi, Alabama, Florida and Georgia. Results were negative in Alabama, Arizona, California, Oklahoma, Louisiana and Mississippi and in the domestic cotton of Florida. No new counties were found to be infested with the pink bollworm during inspection of the 1949 crop.

   Negative inspections for the third successive season made it possible to release from the quarantine Maricopa and Pinal Counties in central Arizona. Pink bollworm inspections were negative throughout the state of Arizona for the first time since 1926.

2. The considerable increase in pink bollworm intensity in several south Texas counties and the Lower Rio Grande Valley in the 1950 crop is a direct result of a failure of the cotton growers to meet stalk destruction schedules in the fall of 1949. It is estimated that at least one additional generation was produced in the Lower Rio Grande Valley of Texas and Mexico and at least two additional generations were produced in south Texas counties, such as Nueces. This situation makes it essential to plan and carry out a more intensive and widespread inspection during 1950 and 1951 of free areas susceptible to infestation by natural means from Nueces County which is 150 miles nearer free territory than the Lower Rio Grande Valley.

3. Wild cotton eradication work in Florida was resumed in July, 1949, and excellent progress was made in getting the project under way. Heavy infestations in wild cotton were found to exist in a number of locations on the mainland keys between Miami and Key West. Many locations which were free of wild cotton plants when the program was discontinued in 1947 were found to still be free during 1949 inspections. However, many plants in the Cape Sable area and on the keys produced literally millions of seed which fell to the ground during the two-year period and will undoubtedly continue to germinate for a number of years.

Golden Nematode Control:

1. Surveys throughout the United States have not disclosed infestations of the golden nematode outside a limited area on Long Island, New York. The Bureau cooperates with New York and other states in surveys and with the State of New York in efforts to prevent its spread and suppress or control known infestations. During the past fiscal year extensive surveys were undertaken cooperatively with 43 states. As of July 1, 1950, golden nematode infestation has been found in 9,021 acres in Nassau and Suffolk counties on Long Island. As a result of large scale housing and industrial developments, 3,000 acres of those infested lands have been removed from cultivation.

2. The compensation program, designed to prevent the increase and spread of this organism, resulted in the withholding of 2,610 acres of infested lands from host cultivation during the 1949 crop season. Of the $340,756.50 paid to growers for this purpose, $157,385.25 was from Federal funds allotted from this appropriation. The balance, $183,371.25 was paid by the State of New York.

3. Research efforts designed to find satisfactory chemical control measures as well as economical and practical means of treating regulated commodities in order that they may move through regular trade channels are being continued by the New York State College of Agriculture (Cornell University), the Bureau of Plant Industry, Soils, and Agricultural Engineering, and other cooperative agencies and individuals. Improvements have been made in machines that can be utilized for field control operations. A machine has been developed to process soil sample lots collected on survey activities. It has increased efficiency and resulted in a saving of man-hours.

Citrus Blackfly Survey:

1. The citrus black fly has spread to almost all of the citrus producing areas of Mexico, and has become a matter of great concern to American citrus fruit growers. Its control is difficult and expensive and the damage it inflicts to both fruit trees and fruit crops is extensive.

2. The Mexican Department of Agriculture, in cooperation with local Black Fly Committees, has been carrying on spray programs in known infested areas where there appears to be a likelihood of controlling the pest. The citrus area contiguous to the American border where the fly might establish itself, however, is so large that these organizations cannot both survey and control newly established infestations. The need for assistance was evident, and in October, 1949, $75,000 of a special appropriation was allotted for making surveys in Mexico to determine where the citrus black fly might be establishing itself in areas which could be dangerous to American citrus culture.

3. Newly established and light infestations have been found in the city of Matamoros, which is just across the Rio Grande from extensive citrus plantings in Texas. Infested dooryard plantings, totaling almost 300, have been discovered in the city of Monterrey, which is on a direct line of traffic to the Lower Rio Grande Valley's extensive citrus plantings. Light infestations have also been found in the commercial citrus plantings at Montemorelos, Mexico.

4. The State of Texas expended $40,000 during this past year to prevent introduction of the citrus blackfly into Texas. This money was used to employ extra inspectors on the International bridges and for additional personnel used on the road stations.

The Texas Citrus Commission appropriated $1,500 for the purchase of spray materials to be used in case citrus blackfly was found in Texas. The Citrus Blackfly Committee of the three Mexican states of San Luis Potosi, Tamaulipas and Nuevo Leon spent $257,178 during the past year for the control of the citrus blackfly.

White-fringed Beetle Control:

1. Through participation by growers and the affected states in the cooperative white-fringed beetle control program, nearly 50 percent of the 77,376 acres of farm land known to be infested with white-fringed beetles has now been soil-treated with 10 pounds DDT per acre. The application of 50 pounds of DDT per acre to nursery land, made in cooperation with nursery stock growers and the affected states and which serves as a basis of certification for movement of plants, has now been completed on over 80 percent of the land planted to nursery stock in the infested areas. The states and growers furnish the insecticide for both the afore-mentioned soil treatments and cultivate it into the soil after application is made with Bureau equipment.

   A few additional infested locations were detected, the most important being in Shelby and Hamilton Counties, Tennessee, and Edgecombe and Mecklenberg Counties, North Carolina.

2. A chemical drench treatment applicable to potted or balled plant material has been developed which facilitates the movement of greenhouse and nursery stock previously required to fumigated before it was eligible for certification.

Soil Acreages Treated for White-Fringed Beetle Control (Accumulative to June 30, 1950) and Acreages to Which Foliage Sprays Were Applied (Calendar Year 1949)

State	Acres Soil Treated With DDT (Accumulative) 50 lbs. per Acre (1948-June 30, 1950	10 lbs. per Acre (1946 - June 30, 1950)	DDT Foliage Applications 1949 Actual Acres	Aggregate Acres
Alabama	674	11,848	7,256	33,955
Florida	80	4,755	924	4,524
Georgia	247	11,915	12,417	60,587
Louisiana	194	26	2,020	9,045
Mississippi	395	2,871	4,326	21,439
North Carolina	119	5,066	4,746	20,548
South Carolina	27	153	120	608
Tennessee	250	529	1,723	7,386
Total	1,986	37,163	33,532*	158,092*
*In addition cryolite foliage applications were applied to:			3,517	7,035
Thereby increasing the total acres receiving foliage treatments to:			37,049	165,127

Hall Scale Eradication:

1. Progress made in Hall scale eradication. In the Hall scale eradication work at Chico, California, nearly 15,000 trees were fumigated with hydrogen cyanide during the winter of 1949-50. On properties having more than 9,000 host trees this was the third fumigation since the last living Hall scale was found. These trees will now be dropped from the treatment schedule, but they will be carefully inspected for at least 3 years. Several new Hall scale infestations were found in the Chico area during the spring of 1950. The total number of infested trees (about 2,000) is comparatively small, and the infested properties are not close to extensive commercial plantings. Surveys at distant points that had previously received trees or propagating wood from the infested area revealed no Hall scale.

Gypsy and Brown-tail Moths:

1. Inspection and Certification of products to prevent spread by artificial means. Through cooperative effort with 530 growers, producers and shippers, movement of various regulated articles to points outside the quarantined area was facilitated under procedures for certification of materials after supervised spray treatment of production areas. At Quincy, Mass., for example, DDT sprays were used in quarry areas to suppress gypsy moth infestation prior to certification of regulated quarry products. Several hundred nursery plots were similarly treated during the pre-larvae period. Pulpwood lots were inspected prior to cutting operations, thereby eliminating the necessity of detailed inspection normally associated with certification of pulpwood shipments. This procedure is finding increasing acceptance, provides necessary safeguards, and reduces the inspection and certification workload during peak shipping periods.

   The value of the products moved under certification from quarantined areas in New York and New England approximated $48,799,000, and included 167,000,000 board feet of lumber, 97,000 cords of pulpwood, 34,400,000 nursery and field-grown plants, 344,300 Christmas trees, and 678,000 tons of quarry products. Over 36,600,000 board feet of lumber and 8,000,000 squares of shingles were certified for shipment to Canada. Inspection and certification provided protection to uninfested sections of the country without unwarranted inconvenience, cost, or interference with the economy of the quarantine area. Cooperating State regulatory agencies materially aided in the activities.

2. Control and survey operations. A total of 600,100 acres or approximately 938 square miles were sprayed with DDT by Federal State, county and municipal cooperating agencies in the work areas in New York, Massachusetts, Connecticut, Vermont and

Pennsylvania. The total acreage sprayed in southeastern Massachusetts amounted to 441,857. This spraying saved several hundred thousand acres of woodlands from being defoliated this year by the gypsy moth.

For the first time since the gypsy moth was discovered in Pennsylvania in 1932 no spraying was necessary, except for a limited amount of mist blower work in and around freight yards, junk yards, collieries, etc.

The insecticides, solvents and the majority of the ground crew personnel for spraying in Pennsylvania, New York and Massachusetts were furnished by the states and local cooperators. New York and Massachusetts mixed their own DDT-oil solution.

SUMMARY OF SPRAYING ACCOMPLISHED - FISCAL YEAR 1950 - BY FEDERAL, STATE AND CONTRACT PLANES, AND GROUND MIST BLOWERS:

	Acres treated with DDT by								
	C-47	C-46	Biplanes			Helicopter	Grand Total	Blowers	Grand
State	Federal	Contractor	Federal	State	Contractor	Contractor	Aircraft	1/	Total
New York	76,624	0	41,675	23,240	0	0	141,539	4,661	146,200
Penna.	0	0	0	0	0	0	0	9,226	9,226
Conn.	0	0	0	0	0	0	0	2,033	2,033
Vermont	0	0	0	0	0	0	0	694	694
Mass.	5,300	244,523	11,671	0	94,276	85,586	441,356	591	441,947
Total	81,924	244,523	53,346	23,240	94,276	85,586	582,895	17,205	600,100

1/ Includes 451 acres by hydraulic sprayer and 298 acres by knapsack sprayer.

During the summer of 1950 metal sex-attractant traps were used to survey 7,534,840 acres, the largest single year's program to date. A total of 20,114 traps were used in the states of New York, Pennsylvania, New Jersey, Vermont, Connecticut, Rhode Island, and Massachusetts. This survey was to determine the effectiveness of that year's spray program, to check on the presence or absence of the gypsy moths in areas not known to be infested, including areas sprayed in former years, and to ascertain the intensity of infestation in western New England.

No male moths were captured in Pennsylvania or New Jersey. No moths were collected within the sprayed areas in New York except in a few locations where specimens were trapped in sections adjacent to unsprayed areas, and in several isolated spots. Subsequent scouting around these places has failed to locate new sources of infestation. In Barnstable, Plymouth and part of Bristol Counties, Massachusetts, where a large area was sprayed in 1948, 1949, and 1950, a number of male moths were trapped in scattered locations. It will be necessary to scout the area at least one or two more seasons to determine if some light infestations remain, or if the catches were a result of windspread from nearby unsprayed areas.

PLANT QUARANTINES

Current Activities: Measures are taken at mainland ports of entry and in Alaska, Hawaii, and Puerto Rico, to prevent introduction from abroad of insect pests and plant diseases detrimental to American agriculture. Plants and plant products for export are certified for compliance with sanitary requirements of other countries. Inspection of domestic plant materials in transit within the continental United States is performed to enforce regulations for preventing spread of injurious insects and plant diseases.

Cooperating agencies include: The Bureau of Customs; Immigration and Naturalization Service; Post Office Department; Public Health Service; and State, Territorial, and Insular plant quarantine services.

Examples of Recent Progress and Trends:

1. Airplane inspection. - Foreign air commerce continues to be a major problem in preventing entry of foreign plant pests and diseases. Among the plant pests intercepted were various species of fruit flies, white flies, weevils, borers, and various other insects which attack such crops as beans, cotton, and grapes. Among the plant diseases intercepted were several well-known diseases of citrus, rusts attacking various cereal crops, a grape canker, a brown rot of pome fruits, the golden nematode of potato and tomato and a related species of nematode attacking wheat.

   The inspection and clearance of aircraft in Hawaii before departure for the mainland was accompanied by a substantial increase in the cargo volume. The increased tempo of military air traffic over Pacific routes will place a heavy workload demand on plant quarantine personnel to prevent spread of the oriental fruitfly and other destructive plant pests.

   The preflight clearance program in Puerto Rico has now had a full year of operation. During 1950 it met two heavy demands for peak service, one during the military and naval training operations in this area and the other in June for a special labor air lift. In the first 17 days of June, 5,337 laborers and their baggage were inspected and cleared in advance of departure on special flights without any delays in scheduled departures. The totals for June were 358 airplanes, 18,037 persons, and 130,936 pieces of baggage cleared prior to departure by air for direct flight to the mainland.

2. Inspection of surface traffic. - The inspection required for plant quarantine clearance of ship, train, vehicular and pedestrian traffic increased in 1950. The number of ship arrivals was greater by 2.3% than those arriving in 1949; the number of vehicles from Mexico increased by 10.5% to a total of 8,380,896. Various devices were employed to spread available manpower so as to care for the arrivals considered to be more important plant quarantine risks.

3. Changes in plant quarantine clearance in cargo. In the plant quarantine handling of cargoes there were several significant trends in

1950. As a result of a reappraisal of pest risk associated with railway cars from Mexico it was possible through a rearrangement of inspection procedures and a reassignment of personnel to greatly reduce the number of freight cars fumigated, without increasing pest risk.

The Bureau program inaugurated in 1949, in cooperation with Mexican officials and grower interests, to police traffic from the mainland of Mexico to Lower California was reorganized and strengthened in 1950. Under this program by which quarantine measures of the Mexican Government are enforced at interior points of Mexico the spread of injurious pests of the Mexican mainland through Lower California to the southwestern United States will be effectively retarded.

Growth of certain foreign plants under post-entry quarantine conditions, a procedure authorized by the 1947 amendment to the Plant Quarantine Act, had its first full year of operation in 1950. During the year 1,127,151 plants in 582 shipments were imported for growing under post-entry quarantine in 38 states. Frequent contacts were made with the cooperating State officials to unify and coordinate the inspection procedures and quarantine method. 47 circulars describing important foreign plant pests were prepared and distributed to the participating officers. In several instances plant pests and suspected virus diseases were found which were undetectable at time-of-entry inspection. Steps were taken to prevent their establishment by fumigation, rogueing, or other comparable action.

4. Transit inspectors are stationed at 33 strategically located transpotation centers within the United States to determine compliance of shippers and transportation agencies with quarantine regulations. A majority of shipments moving via common carriers from areas regulated by Federal domestic plant quarantines pass through these centers to other parts of the country. The inspection of 1,661,306 shipments of regulated articles resulted in the interception of 1,313 shipments found moving in violation of Federal quarantines. Inspectors also reported to the states concerned 432 shipments found moving in violation of state quarantines or plant-shipping regulations. Insect pests or diseases being moved interstate on the material contained in these shipments numbered 48.

The greatly expanding use of motor trucks and air routes for moving regulated articles long distances has added considerably to the potential avenues of pest spread and places severe strain on the inspection service to do its job adequately.

5. Receipts from fees. - During the fiscal year 1950 receipts of $5,314 resulted from the fee charged for fumigating railroad cars entering this country from Mexico ($4.00 per car prior to November 15,1949;

thereafter $6.00 per car). This fumigation is required in certain instances as a safeguard against the introduction of insects, primarily those attacking cotton and fruits. The estimated receipts from this source for 1951 are $1,800, reflecting revised procedures and transportation practices based on pre-treatment of shipments in Mexico. Such receipts are deposited in the general fund of the Treasury.

(b) Control of Emergency Outbreaks of Insects and Plant Diseases

Appropriation Act, 1951 and base for 1952	$2,100,000
Budget Estimate, 1952	2,063,000
Decrease (to provide a direct appropriation to the General Services Administration for certain procurement and leasing costs previously paid from this appropriation)	-37,000

Note: On a funds available basis there is a total decrease of $482,760 due to the availability in 1951 of the unobligated balance of $445,760 from funds appropriated in the Urgent Deficiency Appropriation Act, 1950.

PROJECT STATEMENT

(Reflecting available funds)

Project	1950	1951 (estimated)	Increase or decrease: GSA Adjustment	Increase or decrease: Other	1952 (estimated)
1. Grasshopper and Morman cricket control	$2,571,738	$1,095,760	-$37,000	-$445,760(1)	$613,000
2. General surveys	225,173	200,000	- -	- -	200,000
3. Contingency fund	- -	1,250,000	- -	- -	1,250,000
Subtotal ...	2,796,911	2,545,760	-37,000	-445,760	2,063,000
Unobligated balance	19,263	- -	- -	- -	- -
Total available	2,816,174	2,545,760	-37,000	-445,760	2,063,000
Transferred to: "Control of Forest Pests, Department of Agriculture"..	+250,000	- -			
Transfer in 1951 Estimates to: "Salaries and expenses, Entomology and Plant Quarantine, Department of Agriculture".....	+983,066	- -			

(Continued on next page)

Project	1950	1951 (estimated)
1950 appropriation obligated in 1951	+445,760	-445,760
Total appropriation or estimate	4,495,000	2,100,000

DECREASE

Grasshopper and Morman Cricket Control:

(1) Decrease of $445,760 on a total available funds basis representing the unobligated balance as of June 30, 1950 of the $1,000,000 amount appropriated in the Urgent Deficiency Appropriation Act, 1950, approved March 27, 1950, for grasshopper control which remained available for obligation until September 30, 1950.

STATUS OF PROGRAM

CONTROL OF EMERGENCY OUTBREAKS OF INSECTS AND PLANT DISEASES

Current Activities: Under this item flexible year-to-year programs are carried out as required for the control of incipient and emergency outbreaks of insects and plant diseases that present serious threats to agriculture. The various projects are in general handled on a crop season basis in response to urgent needs. The more important activities now being carried on are (1) cooperation with States to control grasshoppers and Mormon crickets, (2) surveys to detect the status and occurrence of insect pests.

Examples of Recent Progress and Trends

Grasshopper and Mormon Cricket Control

Grasshopper Control:

1. Experience during the past two years demonstrates that farmers can readily control their cropland infestations and that widespread, severe range infestations can be cooperatively controlled at a reasonable cost so as to prevent severe forage losses and important migrations of grasshoppers. This progress is the result of more effective cooperation, more extensive surveys, better and cheaper materials, and improved equipment for applying them.

2. The character of the control program has been modified by the discovery and development of new insecticides that can be purchased and applied by farmers. During the past two years the Federal government has largely discontinued the practice of supplying bait materials for the control of infestations throughout a number of midwest States and in most of the cropland areas of all the western States. Federal participation, therefore, is currently limited to the cooperative suppression of widespread outbreaks on range land, the demonstration of machines and methods through which farmers can conduct their own control work, and the making of annual surveys to determine the potential degrees and locations of infestations.

   In more than 90 percent of the range land areas treated in 1949, severe infestations were reduced sufficiently so that damage was not of economic importance in 1950. Large areas were treated in 1950 and infestations suppressed effectively. The extent of control needed on range lands during 1951 will be determined by analysis of survey data based on observations in the fall of 1950.

Mormon Cricket Control:

1. Through improved methods and prompt action in baiting Mormon cricket infestations in their incipience very little damage has been done in the past few years by Mormon crickets. However, there has been some increase in their numbers in several States where little control work has been feasible during recent years. Therefore, it is quite possible that increased effort will be required in 1951 to prevent serious population increases and crop losses.

General Surveys

1. Chinch Bug Control. Weather conditions prevented serious outbreaks of chinch bugs in 1950 except in localized areas of northeastern Illinois and northern Indiana, where Federally-owned dinitro-orthocresol dust was provided to suppress them. Cooperative surveys will be conducted in the fall of 1950 to determine the 1951 potential.

2. Potato Rot Nematode Survey. During the early part of 1950 cooperative inspections of potatoes in storage from the 1949 crop were made in important producing areas in the Pacific and Rocky Mountain States and in western Nebraska. These inspections failed to detect infestations and offers assurance that the potato rot nematode is not widely prevalent beyond the limited area at Aberdeen, Idaho. Suspicious specimens were collected at Mount Vernon, Washington, and emphasize the need for further inspections in western bulb growing areas where potatoes are also grown. It is proposed to inspect such relatively small areas following the 1950 harvest.

3. Imported Fire Ant Survey. Cooperative surveys indicate that this introduced ant is increasing in abundance and is becoming a significantly destructive pest in many sections of Alabama, Florida and Mississippi. It has been detected also in Louisiana.

4. Citrus Canker Survey. No infections of citrus canker were found in cooperative inspections carried out in Texas and in Louisiana. The old areas of infection in Texas have now been reinspected a second time, and after limited checkup during the coming season it is hoped that further work in that state will be unnecessary. The inspections in Louisiana covered only part of the old area of infection. It is planned to continue cooperation with that state and complete the reinspection within the next two years.

5. Cotton Insect Surveys. State and private agencies increased their contributions to the cooperative survey effort on cotton insects. Infestations of cotton insects appeared unusually early in 1950 and have continued in destructive numbers throughout the season. The boll weevil, leaf worm and boll worm have been present over wider areas and in as great numbers as any of the peak seasons of record. Notwithstanding the advance preparation and increased production of insecticides, materials to control cotton insects have been in close balance with demands since mid-July. Prompt reports on the progress of infestations and close coordination with industry in reference to supplies have been of inestimable value in making it possible for farmers to produce cotton in sections in all states within the cotton belt. The need for continuing this cooperative program in 1951 may be even greater than it has been in 1950.

6. Screwworm Survey. During 1949, the season's important screwworm infestations occurred in several northern sections beyond the normal range of the pest and where stockmen were unfamiliar with control measures. Through advice and cooperative educational programs stockmen were able to treat and protect their livestock and greatly curtail losses which otherwise would have been extensive. Timely warnings and advice of early northern advance of the pest in 1950 contributed materially to action taken by stockmen to protect livestock during the current season.

7. Corn Borer Survey. The cooperative effort to secure factual data on the development of the corn borer through current field inspections was expanded in 1950. Current information is required for advice to farmers on when to apply insecticides for control and when control measures will no longer be beneficial. It is also of material aid in guiding the distribution of supplies of insecticides to areas where they are needed. These field inspections and the accompanying advisory program were especially beneficial this season because the corn borer had entered hibernation in 1949 in numbers well above those of any other year in the main corn producing sections of the central states. It is proposed to continue this cooperative program next season and extend it if necessary to newly invaded sections.

8. Other Surveys. In addition to the above, similar types of cooperative surveys have been carried on to secure information on important pests of other crops, including deciduous fruits, vegetables and tobacco. No survey was carried on during the 1950 season on Hessian fly. During the early spring of 1950 a survey was carried on to secure current data on the infestation of the greenbug. These general activities will be continued in the 1951 season as they contribute materially to the protection of numerous crops.

STATEMENT OF OBLIGATIONS UNDER ALLOTMENTS, WORKING FUNDS, AND TRUST FUNDS

Item	Obligations, 1950	Estimated obligations, 1951	Estimated Obligations, 1952
Research and Marketing Act of 1946 (Title II), Department of Agriculture (Bureau of Entomology and Plant Quarantine):			
Marketing Research and service	$87,188	$100,000	$95,000
Control of Forest Pests, Department of Agriculture (Bureau of Entomology and Plant Quarantine):			
White Pine Blister Rust:			
Leadership, coordination, and technical direction of white pine blister rust control	727,638	725,450	705,000
Blister rust quarantine enforcement	14,966	15,600	15,600
Cooperative blister rust control on State- and privately-owned lands	402,658	354,800	354,500
Total, White Pine Blister Rust	1,145,262	1,095,850	1,075,100
Forest Pest Control Act	276,264	a/ 1,122,500	b/2,593,000
Total, Control of Forest Pests	1,421,526	2,218,350	3,668,100
Working Funds, Agriculture, Agricultural Research Administration, (Bureau of Entomology and Plant Quarantine) Advanced from:			
Department of the Army:			
For investigations and the development of control measures on insects and other arthropods of importance to the Department of Defense	271,568	217,350	- -

a/ Includes $750,000 Contingency Fund.

b/ Figures for 1950 and 1951 exclude allocations to Forest Service and to Bureau of Plant Industry, Soils, and Agricultural Engineering. The 1952 amount reflects total estimate including contingency fund of $2,000,000, pending determination of amount to be allocated to other agencies.

(Continued on next page)

Item	Obligations, 1950	Estimated Obligations, 1951	Estimated Obligations, 1952
Working Funds, Agriculture, Agricultural Research Administration (Bureau of Entomology and Plant Quarantine) Advanced from: Cont.			
Housing and Home Finance Agency:			
For termite experience investigations in the Gulf States	1,894	1,106	- -
Forest Service, Department of Agriculture:			
White pine blister rust control	18,632	- -	- -
Department of the Navy:			
For investigations and the development of control measures on insects and other arthropods of importance to the Department of Defense	33,587	25,908	- -
To cover expenses of providing technical assistance to the Department of the Navy on quarantine and insect control problems in Guam and the Pacific Mandated Islands	13,302	- -	- -
Department of the Air Force:			
For investigations and the development of control measures on insects and other arthropods of importance to the Department of Defense	13,598	375	- -
Total, Working Funds	352,581	244,739	- -

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Item	Obligations, 1950	Estimated Obligations, 1951	Estimated obligations, 1952
Miscellaneous Contributed Funds, Department of Agriculture (Bureau of Entomology and Plant Quarantine): Trust funds deposited by cooperators for cooperative work on blister rust control and barberry eradication, and cooperative experiments on insecticidal residues in animals	$199,305	$200,000	$200,000
TOTAL, OBLIGATIONS UNDER ALLOTMENTS, WORKING FUNDS, AND TRUST FUNDS	2,060,600	2,763,089	3,963,100

PASSENGER MOTOR VEHICLES AND AIRCRAFT

Passenger Vehicles

The request for 34 replacements is in line with the Bureau's program to replace each year those cars which are old and hazardous or uneconomical to operate. During the fiscal year 1950, the Bureau replaced 36 passenger-carrying cars and 46 cars are planned for replacement in 1951. The 34 vehicles proposed for replacement in 1952 represent approximately 10 percent of the passenger vehicles operated. The cars to be replaced will meet the Budget Bureau standards, being 1943 or earlier models, or having mileage in excess of 60,000 miles at the time of trade-in.

All replacements are needed to provide adequate transportation facilities necessary to the efficient conduct of the Bureau's work. Many of the cars are used to reach numerous points where public transportation is inadequate. Rough country roads subject the cars, in some cases, to hard usage.

Airplanes

Five airplane replacements are requested for use in the application of insecticides from the air. Three of these planes are for use in the application of insecticides for the suppression of destructive insects attacking crops and forested areas and two are for use in the suppression of emergency and incipient outbreaks of insects.

It is estimated that the Bureau will require in 1952 the same number of planes as are now being operated. As planes rapidly become obsolete and uneconomical to repair, and are subject to many mishaps, replacement authority is requested for five of the eighteen planes being operated in connection with the program. However, replacements will be made only in the event it is not found practicable and economically feasible to make necessary repairs and retain the present equipment.

CONTROL OF FOREST PESTS

Purpose Statement

For the protection and preservation of forest resources of the United States, it is necessary to suppress and if possible eliminate destructive insect pests and diseases that threaten timber areas. Programs conducted under this appropriation are authorized by the Forest Pest Control Act (16 U.S.C. Sup. 1, 594), the Lea Act (16 U.S.C. 594a), and the Plant Quarantine Act of 1912, as amended (7 U.S.C. 151-167). Activities include two types of work:

1. Control operations to suppress or eradicate forest insect pests and diseases, including the white pine blister rust.

2. Surveys on forest lands to detect and appraise infestations of forest insect pests and tree diseases, and in cooperation with research units to recommend protective measures.

The control programs are carried on jointly by Federal, State, and private agencies under the technical direction and leadership of the Bureau of Entomology and Plant Quarantine. The cooperating Federal agencies include the Bureau of Entomology and Plant Quarantine and the Forest Service of the Department of Agriculture and the National Park Service, Division of Land Utilization, Bureau of Land Management, Fish and Wildlife Service, and the Bureau of Indian Affairs of the Department of the Interior. Survey work is primarily the responsibility of the Bureau of Entomology and Plant Quarantine.

The programs are administered by existing field offices maintained by the several cooperating agencies in the affected forest regions. The personnel engaged in this work have been included in the statements of the cooperating agencies which appear elsewhere.

	Estimated, 1951	Budget estimate, 1952
Appropriated funds	a/ $7,528,458	$9,150,000

a/ Includes anticipated supplemental of $370,000 and $2,079,458 available from prior year balance.

CONTROL OF FOREST PESTS

Summary of Appropriations, 1951 and Estimates, 1952

Item	Total Anticipated available, 1951 a/	Budget estimates, 1952	Increase (+) or Decrease (-)
Control of Forest Pests:			
Forest Pest Control Act	b/2,020,000	5,743,000	+3,723,000
White Pine Blister Rust	3,429,000	3,407,000	-22,000
Total appropriation or estimate	5,449,000	9,150,000	+3,701,000

a/ Adjusted for comparability with the appropriation structure proposed in the 1952 Budget Estimate.

b/ Includes anticipated supplemental of $370,000 and excludes $2,079,458 available from prior year balance.

	Gypsy and Brown-tail Moths	Forest Pest Control Act	White Pine Blister Rust	Total
Appropriation Act, 1951	$560,000	$1,650,000	$3,490,000	$5,700,000
Reduction pursuant to Section 1214	--	--	-60,750	-60,750
Anticipated supplemental	--	370,000	--	+370,000
Activities transferred in 1952 Estimates to:				
"Salaries and expenses, Entomology and Plant Quarantine, Agricultural Research Administration" for gypsy and brown-tail moth control	-560,000	--	--	-560,000
"Salaries and expenses, Office of Information" for distribution of motion pictures	--	--	-250	-250
Base for 1952	--	2,020,000	3,429,000	5,449,000
Budget Estimate, 1952	--	5,743,000	3,407,000	9,150,000
Increase or decrease	--	+3,723,000	- 22,000	+3,701,000

Note: Although there is a net increase of $3,701,000 in direct appropriation shown above for 1952, there will be an increase of $1,621,542 in funds available for obligation in 1952 due to the availability of prior year balance of $2,079,458 in the fiscal year 1951.

SUMMARY OF INCREASES AND DECREASES, 1952
(On the basis of available funds)

Forest Pest Control Act:	
To strengthen detection and appraisal surveys	$+69,000
Increase for operations to control destructive forest pests on lands irrespective of ownership	+3,908,000
Decrease in the contingency fund for the control of forest pests	- 250,000
Decrease due to elimination of prior year balance available in 1951	-2,079,458
Decrease due to providing a direct appropriation to the General Services Administration for certain procurement and leasing costs previously paid from this appropriation	-4,000
Subtotal	+1,643,542
White Pine Blister Rust:	
Decrease due to providing a direct appropriation to the General Services Administration for certain procurement and leasing costs previously paid from this appropriation	- 22,000

PROJECT STATEMENT
(on the basis of available funds)

Project	1950	1951 (estimated)	Increase or Decrease: GSA adjustment	Increase or Decrease: Other	1952 (estimated)
1. Forest Pest Control Act:					
a. Detection and appraisal surveys	$272,957	$281,000	- -	$+69,000(1)	$350,000
b. Operations to control destructive forest pests on lands irrespective of ownership	1,797,548	3,068,458	-4,000	+1,828,542(2)	4,893,000
c. Contingency fund	- -	750,000	- -	-250,000	500,000
Subtotal	2,070,505	4,099,458	-4,000	+1,647,542	5,743,000
2. White Pine Blister Rust:					
a. Leadership, coordination, and technical direction of white pine blister control (Entomology and Plant Quarantine)	727,638	725,450	-20,450	- -	705,000
b. Blister rust quarantine enforcement (Ent.&Pl.Quar	14,966	15,600	- -	- -	15,600

(Continued on next page)

	1950	1951 (Estimated)	Increase or Decrease: GSA adjustment	Increase or Decrease: Other	1952 (estimated)
2. White Pine Blister Rust: (Continued)					
c. Blister rust control operations on the national forests (Forest Service)	1,901,416	1,805,500	-1,000	- -	1,804,500
d. Blister rust control on lands under jurisdiction of Interior Department (Dept. of the Interior)	556,705	527,650	- 250	- -	527,400
e. Cooperative blister rust control on State and privately-owned lands (Entomology and Plant Quarantine)	402,658	354,800	- 300	- -	354,500
Subtotal	3,603,383	3,429,000	-22,000	- -	3,407,000
Unobligated balance..	108,344	- -	- -	- -	- -
Total available	5,782,232	7,528,458	-26,000	+1,647,542	9,150,000
Transferred from:					
"Control of Emergency Outbreaks of Insects and Plant Diseases"	-250,000	- -			
Transferred in 1952 Estimates to:					
"Salaries and Expenses, Office of Information, Department of Agriculture"	+167	+250			
"Salaries and Expenses, Entomology and Plant Quarantine, Agricultural Research Administration"	+569,547	+560,000			
Reduction pursuant to Section 1214	- -	+60,750			
1949 appropriation available in 1950 ...	-450,404	- -			
Anticipated supplemental, 1951	- -	-370,000			
1950 appropriation available in 1951	a/ 2,079,458	a/ -2,079,458			
Total appropriation or estimate	7,731,000	5,700,000			

a/ Represents $1,782,318 unobligated balance of supplemental appropriation of $2,000,000 (available to June 30, 1951) provided in the "Deficiency Appropriation Act, 1950", approved on June 29, 1950, and $297,140 unobligated balance of $750,000 (available to December 31, 1950) appropriated in the "Urgent Deficiency Appropriation Act, 1950" approved March 27, 1950.

INCREASES AND DECREASES

Forest Pest Control Act:

(1) An increase of $69,000 is proposed under the project "Detection and appraisal surveys."

Need for Increase: Early detection of infestations in their incipiency, and prompt action to suppress those of potential importance contribute to reduction of control costs. Field inspections to detect infestations of destructive forest insects and appraise their significance are necessarily made on a sample basis in the areas where infestations are expected or may be known to occur. Funds available for this initial survey work, however, have been inadequate for inspection in a number of suspected areas and for employment of sufficient personnel for thorough investigations. There is need to extend activities to additional sample areas and to provide technical assistance to cooperating workers who contribute information used in detection surveys. The need for strengthening survey activities is recognized by all agencies concerned with forest pest control and there is agreement that this should be done as rapidly as technically trained personnel can be secured for this purpose.

Plan of Work: The increase proposed would aid in carrying out detection and appraisal surveys in a more adequate manner. It is planned to place trained entomologists at established headquarters in two additional sections of the country. These men would direct survey work in the southeastern section of the country from Gulfport, Miss., and in the southwestern section from Albuquerque, New Mexico. They would direct seasonally-employed technical aides who would conduct the field operations, would be responsible for informing forest rangers and others in matters related to detecting infestations, and for organizing appropriate coordinated arrangements in these particular areas. In addition, the work in other areas already established would be strengthened where the need is greatest. Practically the full amount of the increase would be used for seasonal employment and for travel expenses incident to needed field inspections.

(2) A net increase of $1,578,542 in funds available for control operations representing an increase of $1,828,542 under the project "Operations to control destructive forest pests on lands irrespective of ownership", and a decrease of $250,000 to provide a contingency fund of $500,000.

Need for Increase: An increase of $1,578,542 to provide a total "base" fund of $5,393,000 is believed essential to provide for combatting forest pests during the fiscal year 1952. Information now available clearly points to the need for vigorously continuing the program to control the Engelmann spruce bark beetle and it is estimated that a total of $3,750,000 will be required for that purpose during 1952. This $3,750,000 will be programmed for expenditure as follows:

(1) $3,400,000 for control operations after July 1 of the calendar year 1951 control season and (2) $350,000 for control operations prior to July 1 of the calendar year 1952 control season. There will also be needed $900,000 to combat the spruce budworm in Oregon and Washington. This $900,000 will be programmed as follows: (1) $200,000 for control operations after July 1 of the calendar year 1951 control season and (2) $700,000 for control operations prior to July 1 in calendar year 1952. In addition to these infestations, preliminary information regarding infestations of other important pests clearly indicates that several outbreaks should be combatted in 1952 to protect valuable timber resources on Federally-owned lands. For the most part these relate to programs which have been the subject of budgetary consideration and on which some work has been carried on. Based on currently-available survey data, the estimated costs of these control programs are listed below:

Item		Estimated Costs, Fiscal Year 1952
Engelmann spruce bark beetle in Colorado:		
Fall of 1951	$3,400,000	
Spring of 1952	350,000	
		$3,750,000

The aggressive infestation of Engelmann spruce bark beetle continues to threaten the spruce forests of Colorado. The value of green timber that may be destroyed is in excess of 32 million dollars. The future of the present lumber industry and the possibility of a permanent pulp industry depend on a continuous source of supply of spruce timber. The suppression of the infestation is essential to the economy of the area. Satisfactory progress has been made to combat the infestation and procedures have been developed to carry the work forward efficiently. Information to date substantiates that the measures being used are effective in combatting the infestation and are preventing enormous losses.

Spruce budworm in Oregon and Washington:		
Fall of 1951	$200,000	
Spring of 1952	700,000	
		$900,000

This control operation is the concluding phase of effective work initiated in 1949. It continues to be a cooperative undertaking involving major financial contributions from both State and private land owners, approximately 30% of the 1 million acres it is planned to spray being other than federal ownership. Threatened are the nationally important Douglas-fir stands in the Pacific Northwest.

			Estimated Costs, Fiscal Year 1952
Western pine beetle in Coulter pine in southern California	Fall of 1951	10,000	
	Spring of 1952	10,000	$20,000

Infestation of western pine beetle are increasing in southern California and are threatening to destroy the finest forest in this area where the greatest value is recreational and of high importance to a densely populated area. The amount indicated is that estimated, on the basis of survey data now available, to reduce the infestation and prevent immediate large-scale killing of trees.

Western pine beetle on ponderosa pine in northern California	Fall of 1951	30,000	
	Spring of 1952	30,000	60,000

The western pine beetle is active in epidemic proportions in the highly valuable commercial forests of the Sierra Mts. The Yosemite and Sequoia National Parks are also threatened.

Black Hills beetle in Denver Mt. Parks and Arapaho and Pike National Forests	Fall of 1951	2,000	
	Spring of 1952	8,000	10,000

The Black Hills beetle is killing ponderosa pine throughout this highly developed and intensively used recreation country. The loss of these trees would adversely affect the recreation business.

Budworm in spruce on private lands in Maine	Spring of 1952		40,000

This is a cooperative undertaking involving major contributions from private land owners. Affected, primarily in Maine, is the spruce pulpwood industry in the northeast.

Mt. Pine beetle in lodgepole pine on Cabinet Forest in Montana	Fall of 1951	2,000	
	Spring of 1952	8,000	10,000

At stake are the commercially valuable lodgepole pine stands on the Cabinet National Forest in northwest Montana. Additionally threatened are the extensive stands of this species in that portion of the State. This is the concluding phase of a control program carried on during the past two years.

			Estimated Costs, Fiscal Year 1952
Mt. Pine beetle in lodgepole pine on Kootenai National Forest, Montana	Fall of 1951	5,000	
	Spring of 1952	15,000	
			20,000

Infestation of the mountain pine beetle in the Kootenai National Forest, which threatens destruction of an extensive area of lodgepole pine, is now being combatted. The amount indicated is for necessary follow-up work in 1952. The permanence and stability of an established pole-treating industry is dependent upon this timber.

Great Basin tent caterpillar in aspen on Carson and Santa Fe National Forests in New Mexico	Spring of 1952		25,000

This insect pest has defoliated extensive aspen stands and is prevalent in such vast numbers that it is adversely affecting the recreation business, contaminating water and interfering with the orchard business. This is a continuation of very effective control work done in the past.

Black Hills beetle in ponderosa pine on Dixie National Forest in southern Utah	Fall of 1951	10,000	
	Spring of 1952	10,000	
			20,000

Commercially valuable ponderosa pine stands are threatened. Additionally the Bryce Canyon National Park is also threatened. This work should place the epidemic on a maintenance basis after this year.

Spittlebugs and sawflies in pine plantations on National Forests in Wisconsin and Michigan (Summer project)	1951	20,000	
	1952	5,000	
			25,000

Infestations of spittlebugs and sawflies continue to occur and destroy plantations in the National Forests in Michigan and Wisconsin. Control measures are effective and are applied in those sections where infestations are heaviest. These insects, however, continue to persist and build up in local spots in various sections. There is every reason to believe that infestations of epidemic proportions will be detected in additional locations and that approximately $25,000 will be needed to suppress them in 1952.

Miscellaneous small projects on lands under control of Forest Service, Department of Agriculture, in several states	Fall of 1951	1,000	
	Spring of 1952	4,000	
			5,000

		Estimated Costs, Fiscal Year 1952
Miscellaneous small projects on lands under control of the Department of Interior in several states		
Fall of 1951	2,000	
Spring of 1952	6,000	
		8,000
Total, control projects		4,893,000
Detection and appraisal surveys		350,000
Contingency fund		500,000
Total, 1952 Estimate		5,743,000

The following statement provides a tentative project breakdown comparing funds available in fiscal year 1951 with the estimate for fiscal year 1952 for forest pest control operations:

Project	1951	1952
California		
Western pine beetle in coulter pine in Southern California	20,084	20,000
Western pine beetle in ponderosa pine in northern California	75,000	60,000
Colorado		
Englemann spruce bark beetle in Englemann spruce on National Forests	2,149,298	3,750,000
Black Hills beetle in ponderosa pine on Roosevelt National Forest (Experimental)	10,000	-
Black Hills beetle in ponderosa pine in Denver Mt. Parks and Arapaho & Pike National Forests	8,200	10,000
Douglas-fir beetle in Douglas-fir on Roosevelt National Forest and Rocky Mt. National Park	19,060	-
Miscellaneous small projects on National Forests and private lands	17,000	-
Idaho (Wyoming)		
Mountain pine beetle in white pine on Clearwater and Coeur d'Alene National Forests	22,000	-
Engelmann spruce bark beetle in Engelmann spruce on Payette National Forest	11,300	-
Miscellaneous small projects	1,800	-
Mountain pine beetle in lodgepole pine on Targhee-Teton National Forests and in Wyoming on the Grand Teton National Park	196,958	-
Maine		
Spruce budworm on privately owned lands	40,000	40,000

Project	1951	1952
Montana		
Mountain pine beetle in lodgepole pine on the Cabinet National Forest	-	$10,000
Mountain pine beetle in lodgepole pine on the Kootenai National Forest	34,254	20,000
New Mexico		
Tent caterpillar in aspen on Santa Fe and Carson National Forests	3,245	25,000
Oregon and Washington		
Spruce budworm on National Forests and private lands	1,033,571	900,000
Mountain pine beetle in lodgepole pine on Deschutes National Forest	50,000	-
South Dakota		
Black Hills beetle in ponderosa pine on the Harney and Black Hills National Forests	13,200	-
Utah		
Black Hills beetle in ponderosa pine on the Dixie National Forest	25,000	20,000
Miscellaneous small projects	4,900	-
Wisconsin and Michigan		
Spittlebug and sawflies in pine plantations on National Forests	37,951	25,000
Miscellaneous Small Projects		
On National Forests in Pennsylvania, Nevada, and Southeastern United States	2,197	5,000
On lands under control of the Department of the Interior	43,440	8,000
Contingency Fund	-	500,000
Total	3,818,458	5,393,000

STATUS OF PROGRAM

FOREST PEST CONTROL ACT

Current Activities. This program contemplates carrying out the purposes of the Forest Pest Control Act, approved June 25, 1947, which established a national policy to protect and preserve forest resources of the United States from destructive insect pests and diseases, thereby enhancing the growth and maintenance of forests, promote stability of forest-using industries, aid in forest fire control, conserve forest cover on watersheds, and protect recreational and other values of forests.

The Bureau of Entomology and Plant Quarantine is responsible for detection and appraisal surveys and for leadership in cooperative control programs conducted on State and privately owned lands. The Forest Service conducts control activities on lands under its jurisdiction. The various units of the Department of the Interior are responsible for control activities conducted on lands under their jurisdiction.

Examples of Recent Progress and Trends

Detection and Appraisal Surveys. Surveys made during the 1949 season disclosed some 35 infestations of insects that were of potential importance. Many of these were of small size and subsequent control operations were carried out to hold the infestations in check or reduce them to noncommercial significance. Detection surveys made on a sample basis have proved to be substantially accurate when more detailed surveys were made to mark trees or define areas in advance of treatment.

1. During the year emphasis has been placed on securing cooperation from other agencies and concerns interested in forest protection. A striking example of this cooperative program was the survey carried on in Washington and Oregon to appraise the extent and status of the infestation of the spruce budworm. Under the leadership of the Bureau of Entomology and Plant Quarantine an intensive survey was carried on in cooperation with the Forest Service, land managing agencies of the Department of the Interior, the State Foresters, and representatives of private industry, which led to the appraisal and planning of a control program of considerable magnitude.

2. In the New England area, particularly in Maine, cooperative detection and appraisal surveys developed factual information regarding the infestations of spruce budworm. Similar cooperative surveys aided in defining areas and appraising the intensity of infestation of bark beetles.

3. Surveys to assemble information in reference to forest tree diseases have been carried on by the Bureau of Plant Industry, Soils, and

Agricultural Engineering. Particular attention has been directed to the pole blight disease in the Northwest where considerable areas have been surveyed from the air and checked in part by ground crews. Information has been assembled in reference to birch die-back in the Northeast.

4. Considerable use has been made of aerial photography in surveys on insects and on tree diseases to identify affected areas.

Control Activities. Control activities in 1950 were largely directed to projects of major significance, work on areas of less immediate hazard being deferred in many instances.

1. The bark beetle infestation in the Harney and Black Hills National Forests in South Dakota was brought under control and the work practically completed during the spring of 1950. A limited amount of "mop-up" work remains to be done during the fall of 1950 and early spring of 1951. There was State cooperation in treating the small number of infested trees on State lands.

2. A rather heavy infestation of the mountain pine beetle endangering valuable lodgepole pine stands in the Thompson River area of Cabinet National Forest was combatted in cooperation with private owners. To clean up this area will require further small scale operations.

3. A widespread infestation of spruce budworm in the Washington-Oregon area has been aggressively combatted through a cooperative program engaging several Federal agencies and State and private agencies. The Forest Service was responsible for the administration of the control program on Federally-owned lands (including small areas controlled by the Department of the Interior), and the State Forester of Oregon was responsible for the control work on State and privately-owned lands. The current season project has continued under unified technical leadership and operating plans. Operationally agencies engaged in control have used the same requirements in contracts for application of insecticides and the same specifications for procurement of the materials required. Recent information confirms the fact that control was fully as effective on the 934,000 acres treated this year as in 1949 when about 267,000 acres were treated by the same methods. Not all of the infested area was included in the 1950 control project. It is expected that approximately another million acres will have to be treated before the infestation has been brought under control and excessive losses prevented.

4. Control activities on state and privately-owned lands were limited to the three specific projects mentioned above and a small test-control project to combat the spruce budworm in Maine.

5. A major project involved the intensive infestation in the Targhee Teton National Forest and the Grand Teton National Park where mountain pine beetle was killing a considerable quantity of lodgepole pines and threatened extensive uninfested areas. Current information indicates that this infestation is being brought under control and that the remaining control work can be carried on in the spring of 1951 in connection with post-control surveys.

6. Intensive small-scale tests on methods of treatment for Engelmann spruce bark beetle were made in the fall of 1949. These demonstrated the practicability of using newly developed methods to combat this insect which has already caused excessive losses in spruce in Colorado and is spreading to new areas. An aggressive program to combat this infestation was outlined and the work done proved highly effective. It is expected that this control program will be continued at the same level during the next season.

7. The effectiveness of controls for spittle bug in pine plantations in National forests of Michigan and northern Wisconsin were again demonstrated. In areas where control was applied the infestation has been suppressed. The insect is occurring in many areas of this general section, and continuing control programs will be needed to protect pine reproduction. Infestations of certain species of sawflies which defoliate and usually kill the reproductive pine trees occur in various sections of the Lake Region and control projects have been initiated. These pests appear in other sections and similar suppressive projects are planned.

8. The Forest Service and the Department of the Interior also carried on control activities affecting a number of small projects. These small control programs followed cooperative reviews by the land managing agencies and the Bureau of Entomology and Plant Quarantine, including an appraisal of necessity and benefits. To illustrate, the Department of the Interior carried on 13 small control projects in Florida, Georgia, Oregon, Tennessee, Colorado, Utah, Arizona, New Mexico, and California. Additional projects were carried on by the Forest Service on lands under their control in Idaho, Utah, Colorado, New Mexico, California, and Minnesota.

WHITE PINE BLISTER RUST

Current Activities. The purpose of this work is to control the destructive, introduced, blister rust disease of white pines which destroys one of our most valued forest resources.

Under the authorizing legislation and agreements with cooperating agencies, the Bureau of Entomology and Plant Quarantine is responsible for leadership, coordination, and technical direction of the overall phases of the work for all the participating agencies and, in addition, for cooperative control work on state and private lands. The Forest Service is responsible for control work on National Forest lands; and the Department of the Interior for control work on National Park, Indian, public domain and Oregon and California Revested lands. In carrying out its overall responsibilities, the Bureau of Entomology and Plant Quarantine:

(a) Selects white pine areas for protection.
(b) Classifies these areas for lumber production, or for aesthetic and recreational values in relation to the feasibility of control.
(c) Schedules the time interval for reworking control areas.
(d) Examines burned and logged areas for retention or elimination from control areas.
(e) Inspects planting sites to select those that are ribes-free.
(f) Conducts surveys to determine location of host plants, spread of rust, degree of damage, and effectiveness of applied control measures.
(g) Develops new methods of destroying ribes and tests new chemicals and equipment.
(h) Recruits and trains seasonal workers for participating agencies.
(i) Keeps records and maps for all control work.
(j) Selects sites for seasonal camps.
(k) Works out practical solutions for troublesome control problems.
(l) Maintains quarantine restrictions to prevent replanting of ribes in control areas.

Examples of Recent Progress and Trends

1. Over 18 million ribes were destroyed on about 1,443,000 acres during the calendar year 1949 by the cooperating Federal, State, private and local agencies. Initial work was performed on 374,103 acres, and rework to maintain control of the disease was applied on 1,068,917 acres. The Bureau and cooperating State and private agencies destroyed over 7,410,000 ribes on 1,171,861 acres of forest land. On national forests 208,987 acres were cleared of 6,631,500 ribes. Nearly 4,000,000 ribes were removed from 62,172 acres of white pine forests managed by the

Management, Department of the Interior. Control of the rust on areas totaling 852,557 acres reached the stage where they were placed on maintenance.

2. Ribes eradication work done by contract increased over the previous year. Cooperating agencies issued 165 contracts for work on 23,378 acres. This method was used on about 26 percent of the acreage worked in the sugar pine region and 5 percent in the western white pine region. The cost of working these areas under the contract procedure was less than it would be if done with temporary labor from seasonal camps. Contracting ribes eradication on small areas is used in the western forest areas wherever working conditions are suitable for use of this procedure and where bidders are available. A greater use will be made of the contract procedure as more bidders become qualified by training and experience to undertake contracts for ribes eradication.

3. The use of chemicals permits more rapid coverage of heavily infested work areas at less cost than by hand-pulling of the ribes and it has a definite place in control operations wherever it is practical and less costly than other methods. Eradication with 2,4-D and 2,4,5-T was continued in the western white pine and sugar pine regions on areas where the plants were abundant and on local concentrations of ribes in eastern white pine areas. Over 3 million ribes on 3,258 acres in the western regions were treated with these chemicals during the calendar year 1949.

4. The following tables give the status of the work at the end of the calendar year 1949.

WHITE PINE BLISTER RUST CONTROL

Table 1.--Ribes Eradication by Operating Agencies
during the calendar year 1949
(Initial and Rework)

Operating Agencies	Initial Eradication (Acres)	Reeradi-cation (Acres)	Total (Acres)	Effective Labor (Man-Days)	Ribes Destroyed (Number)
Federal:					
National Forests	104,236	104,751	208,987	72,201	6,631,567
Interior Department:					
O&C Revested Lands	7,448	14,986	22,434	1,770	33,402
National Parks	6,587	13,457	20,044	19,464	3,151,908
Indian Reservations	7,238	12,456	19,694	7,637	806,000
Sub-total: Interior	21,273	40,899	62,172	28,871	3,991,310
Total - Federal	125,509	145,650	271,159	101,072	10,622,877
State and Private	248,594	923,267	1,171,861	63,044	7,410,659
Grand Total	374,103	1,068,917	1,443,020	164,116	18,033,536

Table 2.--Progress of Ribes Eradication on State and Private Lands through 1949

Region	Total Acres	First Working		Second Working	Other Workings	On Maintenance		Remaining Work	
	Control Area	Acres	Per Ct.	Acres	Acres	Acres	Per Ct.	Unworked Acres	Requiring rework Acres
Northeastern	11,337,390	10,619,830	94	6,120,450	1,893,790	4,789,820	42	717,560	5,830,010
So.Appalachian	5,264,000	5,205,600	99	195,800	47,600	4,953,800	94	58,400	251,800
North Central	3,405,400	2,552,300	75	843,500	144,900	1,029,200	30	853,100	1,523,100
Sub-total:East	20,006,790	18,377,730	92	7,159,750	2,086,290	10,772,820	54	1,629,060	7,604,910
Northwestern	1,177,000	675,000	57	196,000	76,000	239,000	20	502,000	436,000
Pacific Coast	682,305	405,185	59	167,144	91,750	69,065	10	277,120	336,120
Sub-total:West	1,859,305	1,080,185	58	363,144	167,750	308,065	17	779,120	772,120
Grand Total	21,866,095	19,457,915	89	7,522,894	2,254,040	11,080,885	51	2,408,180	8,377,030

Table 3.--Progress of Ribes Eradication on Department of Interior Lands through 1949

Region	Total Acres	First Working		2nd Working	Other Workings	On Maintenance		Remaining Work	
	Control Area	Acres	Per Ct.	Acres	Acres	Acres	Per Ct.	Unworked Acres	Requiring rework-Acres
NATIONAL PARKS									
Northeastern	16,870	16,870	100	16,870	8,210	16,870	100	--	--
So. Appalachian	137,900	137,200	99	8,100	5,100	128,500	93	700	8,700
North Central	100	100	100	--	--	--	--	--	100
Subtotal - Eastern	154,870	154,170	100	24,970	13,310	145,370	94	700	8,800
Northwestern 1/	24,840	18,440	74	9,077	12,601	11,426	47	6,400	7,014
Pacific Coast	235,180	112,233	48	50,189	13,309	28,772	12	122,947	83,461
Subtotal - Western	260,020	130,673	50	59,266	25,910	40,198	15	129,347	90,475
Total - National Parks	414,890	284,843	69	84,236	39,220	185,568	45	130,047	99,275
O & C REVESTED LANDS									
Pacific Coast	83,114	41,424	50	14,867	--	21,275	26	41,690	20,149
PUBLIC DOMAIN LANDS									
Northwestern	30,000	17,000	57	6,000	3,000	7,000	23	13,000	10,000
INDIAN LANDS									
So. Appalachian	450	450	100	--	--	450	100	--	--
North Central	129,300	122,200	95	66,600	33,700	76,700	59	7,100	45,500
Total - Indian Lands	129,750	122,650	95	66,600	33,700	77,150	59	7,100	45,500
GRAND TOTAL	657,754	465,917	71	171,703	75,920	290,993	44	191,837	174,924

1/ Includes Mt. Rainier 4,100a/ acres, Glacier 5,140b/, Yellowstone 9,600c/, and Rocky Mountain 6,000c/.

a/ 510 acres added - previous maps in error.
b/ 140 acres added.
c/ Final acreage to be determined.

Table 4.—Progress of Ribes Eradication on National Forest Lands through 1949

Region	Total Acres	First Working		2nd Working	Other Workings	On Maintenance		Remaining Work	
	Control Area	Acres	Per Ct.	Acres	Acres	Acres	Per Ct.	Unworked Acres	Requiring re-work-Acres
Northeastern	8,300	8,300	100	6,260	4,420	5,970	72	- -	2,330
So. Appalachian	1,713,000	1,702,200	99	82,100	27,100	1,608,600	94	10,800	93,600
North Central	375,700	282,400	75	139,900	46,900	170,900	46	93,300	111,500
Subtotal-East	2,097,000	1,992,900	95	228,260	78,420	1,785,470	85	104,100	207,430
Northwestern	1,405,000	1,070,000	76	307,000	100,000	354,000	25	335,000	716,000
Pacific Coast	785,550	435,940	56	220,843	129,266	79,098	10	349,610	356,842
Subtotal-West	2,190,550	1,505,940	69	527,843	229,266	433,098	18	684,610	1,072,842
Total	4,287,550	3,498,840	82	756,103	307,686	2,218,568	52	788,710	1,280,272

Table 5.—Progress of Ribes Eradication on Lands in all Ownerships through 1949

Region	Total Acres	First Working		2nd Working	Other Workings	On Maintenance		Remaining Work	
	Control Area	Acres	per Ct.	Acres	Acres	Acres	Per Ct.	Unworked Acres	Requiring re-work-Acres
Northeastern	11,362,560	10,645,000	94	6,143,580	1,906,420	4,812,660	42	717,560	5,832,340
So. Appalachian	7,115,350	7,045,450	99	286,000	79,800	6,691,350	94	69,900	354,100
North Central	3,910,500	2,957,000	76	1,050,000	225,500	1,276,800	33	953,500	1,680,200
Subtotal-East	22,388,410	20,647,450	92	7,479,580	2,211,720	12,780,810	57	1,740,960	7,866,640
Northwestern	2,636,840	1,780,440	68	518,077	191,601	611,426	23	856,400	1,169,014
Pacific Coast	1,786,149	994,782	56	453,043	234,325	198,210	11	791,367	796,572
Subtotal-West	4,422,989	2,775,222	63	971,120	425,926	809,636	18	1,647,767	1,965,586
Total	26,811,399	23,422,672	87	8,450,700	2,637,646	13,590,446	51	3,388,727	9,832,226

PASSENGER MOTOR VEHICLES AND AIRCRAFT

Passenger Vehicles

Of the 5 vehicles to be replaced all will be 1943 or older models and will have been driven in excess of 60,000 miles. The work conducted is in widely separated areas, and the fleet now being maintained is the minimum required to transport supervisory personnel throughout these areas. The maintenance of the fleet at its present level is in the best interest of the efficient conduct of the work.

Airplanes

Two replacements for planes which are used for detection surveys in forested areas are requested. The surveys are conducted to determine the status of forest pests as a basis for control measures. The two replacements will be made only in the event it is found impracticable or uneconomical to make repairs to those planes already in operation.

FOREST SERVICE

Purpose Statement

The Forest Service is charged with responsibility for promoting the conservation and wise use of the country's forest and related watershed lands, which comprise one-third of the total land area of the United States. Authority for the work of the Service stems from numerous acts, the more important ones being the Timber Culture Repeal Act of March 3, 1891; Sundry Civil Appropriation Act of June 4, 1897; "Transfer" Act of February 1, 1905; "Weeks" Act of March 1, 1911; Act of June 7, 1924; Forest Research Act of May 22, 1928; and Cooperative Forest Management Act of August 25, 1950.

To meet its responsibility the Forest Service engages in three main lines of work, as follows:

(1) Management, protection, and development of the National Forests. Under instructions from Secretary Wilson in 1905 this is to be done for "the greatest good of the greatest number in the long run." This in turn calls for obtaining the maximum practicable yield and use of their many resources on a continuing basis, to meet both local and national needs - under both normal conditions and during times of stress. The 181,000,000 acres of National Forests are located in 40 States, Alaska, and Puerto Rico.

In managing the National Forests technical forestry is applied to the growing and harvesting of timber crops. Estimated harvest through timber sales in 1951 is 3.8 billion board feet. The grazing of approximately nine million head of livestock is scientifically managed to obtain range conservation along with use of the annual growth of forage. Watersheds are managed for regulation of stream flow, flood control, sources of water for power, irrigation, navigation, and municipal supply. Some provision is made for the more than 20 to 50 million visits of people to the National Forests for recreation purposes. Effort is made to apply needed scientific management to the extensive wildlife resources. Receipts from timber sales, grazing permits and other sources exceeded $34,000,000 in 1950. Estimated receipts for 1951 are $42,000,000.

The protection of the National Forests is a major responsibility and includes the control of forest fires which numbered 9,736 in the first eleven months of the calendar year 1950; the control of tree diseases and insect epidemics; and the prevention of trespass.

The major development activities on the National Forests consist of:

(a) Reforestation of denuded and lightly stocked forest lands.
(b) Revegetation of denuded range lands.
(c) Construction of improvements, mainly roads which are extremely important (and largely self-liquidating) because of the large bodies of inaccessible mature and overmature timber on the National Forests which are needed for housing and other uses. One-third of the remaining sawtimber in the country is in the National Forests.

(d) The acquisition of additional forest land through purchase and exchange.

(2) Cooperation with the States and private forest landowners is provided by the Forest Service:

(a) To obtain better fire protection on the 427,000,000 acres of State and privately owned forest lands.
(b) To obtain better forest practices on and returns from 345,000,000 acres of commercial forest lands in private ownership. Only about 8 percent of the cutting on such lands is now being done in line with good forestry practice.
(c) To aid in the distribution of planting stock to private forest landowners for the purpose of establishing forests and shelterbelts.
(d) To stimulate development and proper management of state, county and community forests.

(3) Forest and Range Research. The Forest Service conducts investigations in the entire field of forestry and range management, regardless of ownership, including the growth, protection, and harvesting of timber; management of range lands; protection and management of watersheds; and research in forest economics. It is conducting a forest survey of the United States - a study of present extent and potential growth and utilization of the Nation's forest resources. Research to obtain greater use of the tremendous waste, and to obtain more efficient and economical utilization of forest products is a major program, centered at the Forest Products Laboratory, Madison, Wisconsin. The results of research are available to consumers and manufacturing plants generally, to the more than 4,000,000 owners of private forest and range lands, and to the many public agencies which administer such lands.

In addition, the Forest Service carries on the following activities:

(4) Flood Control. In areas assigned by the Secretary, the Forest Service makes preliminary examinations and surveys under the Flood Control Act of 1936, as amended and supplemented, and installs watershed improvement measures to retard runoff and reduce flood water and sediment damage in Congressionally authorized watersheds. The Service has primary responsibility for watershed improvement measures on National Forests and adjacent range lands used in conjunction with such forests, and other forest lands. Work on non-Federal lands is carried on in cooperation with appropriate State and local agencies.

(5) Work performed for others. Because of the widespread geographical location of Forest Service activities, the technical skills available in the organization, and for other similar reasons, the Forest Service is frequently called upon to perform services for other Federal, State, and private agencies on a reimbursable or advance payment basis. All projects benefit the Forest Service as well as the cooperator. Examples of these activities are:

(a) Protection of private and other Federal forest lands intermingled with the National Forests.

(b) Disposal of slash resulting from sales of timber to contractors on National Forests, and the rehabilitation of such areas.
(c) Construction and maintenance of roads, and other improvements.
(d) Investigations in forest, range, and water management and utilization problems.
(e) Cooperative survey, mapping, administrative, reforestation projects, etc.
(f) Cooperation with the National Production Authority on requirements, production and supplies of forest products and in stimulation of production through various devices.

The Forest Service maintains its central office in Washington with program activities decentralized to 10 Regional offices, 135 Forest Supervisors offices, 750 District Rangers offices, 12 Forest and Range Experiment Stations, the Forest Products Laboratory, and 62 Research Centers. On November 30, 1950 the Forest Service had 8,944 full time employees, of whom 322 are in the central office, and the balance in the field, and 1,959 part time employees in the field. The November 30 employment figures for the field are lower than average for the year because of seasonal factors.

	Estimated, 1951	Budget estimate, 1952
Appropriated funds:		
National forest appropriations	a/$44,801,525	$54,297,000
Cooperation with States	10,832,800	10,820,000
Research appropriations	5,220,500	5,345,000
Total appropriated funds (excluding permanent appropriations)	60,854,825	70,462,000

a/ Excludes $1,155,062 available from prior-year balance.

FOREST SERVICE

Summary of Appropriations, 1951, and Estimates, 1952

	Total estimated available, 1951 a/	Budget estimates, 1952	Increase (+) or decrease (-)
Salaries and Expenses:			
National forest protection and management	$27,122,025	$29,655,000	+$2,532,975
Fighting forest fires	b/ 6,000,000	6,000,000	- -
Forest research	5,220,500	5,345,000	+124,500
Total, Salaries and Expenses	38,342,525	41,000,000	+2,657,475
Forest development roads and trails	c/10,437,500	17,500,000	+7,062,500
Acquisition of lands for national forests:			
Weeks Act	250,000	100,000	-150,000
Superior National Forest, Minnesota	d/ 150,000	150,000	- -
Acquisition of lands from national forest receipts	142,000	142,000	- -
State and private forestry cooperation	10,832,800	10,820,000	-12,800
Cooperative range improvements	700,000	750,000	+50,000
Payments to school funds, Arizona and New Mexico, national forests fund (permanent)	71,930	71,930	- -
Payments to Minnesota, national forests fund (permanent)	45,000	45,000	- -
Payments to states and territories from national forests fund (permanent)	8,372,747	10,354,017	+1,981,270
Roads and trails for states, national forests fund (permanent)	3,350,379	4,141,607	+791,228
Total	72,694,881	85,074,554	+12,379,673
Deduct permanent appropriations (shown in detail above)	11,840,056	14,612,554	+2,772,498
Total, excluding permanent appropriations	60,854,825	70,462,000	+9,607,175

a/ Amounts are adjusted for comparability with the appropriation structure proposed in the 1952 Budget Estimates.
b/ Includes $367,824 obligated in prior year.
c/ In addition, $1,146,638 prior year balance available.
d/ In addition, $8,424 prior year balance available.

The Budget estimates propose the consolidation of Forest Service appropriations and subappropriations as follows:

1. Consolidation of the subappropriation "General Administrative Expenses", with other appropriations.

2. Consolidation of "Forest and Range Management Investigations", "Forest Products", and "Forest Resources Investigations" under a new subappropriation "Forest Research".

3. Consolidation of "Forest Fire Cooperation" and "Farm and Other Private Forestry Cooperation" under a new heading "State and Private Forestry Cooperation".

This proposal would simplify the appropriation structure and the administrative functions of the Bureau, and would in no way affect the nature and scope of the work being conducted. The following table compares the existing appropriation and project structure for the above items with that proposed in the 1952 Budget Estimates.

PROPOSED CONSOLIDATION OF APPROPRIATION ITEMS ON REVISION OF ACTIVITY SCHEDULES

(Based on amounts appropriated for 1951)

PRESENT STRUCTURE		PROPOSED STRUCTURE																	
		SALARIES AND EXPENSES									FOREST DEVELOPMENT ROADS AND TRAILS			STATE AND PRIVATE FORESTRY COOPERATION					
Appropriation Items or Financial Projects	Total Amount	Sub-appropriation	Financial Project		Sub-appropriation	Financial Project	Sub-appropriation	Financial Project			Total	Financial Project		Total	Financial Project				
		National Forest Protection and Management	Resource protection and use	Resource development	Fighting Forest Fires	Fire suppression	Forest Research	Forest and range management investigations	Forest products investigations	Forest resources investigations		Construction of roads and trails	Maintenance of roads and trails		Cooperation in forest fire control	Cooperation in forest tree planting	Cooperation in forest management and processing	Cooperation in farm forestry extension	General forestry assistance
SALARIES AND EXPENSES:																			
GENERAL ADMINISTRATIVE EXPENSES	$665,000	$390,300	$362,600	$27,700	---	---	$112,000	$66,600	$25,400	$20,000	$94,900	$19,200	$75,700	$67,600	$24,900	$1,600	$5,300	---	$36,100
NATIONAL FOREST PROTECTION AND MANAGEMENT	27,100,000	27,100,000																	
Timber resource management	4,601,400		4,601,400																
Range resource management	1,076,000		1,076,000																
Wildlife resource management	134,400		134,400																
Water resource management	48,600		48,600																
Recreation resource management	610,350		610,350																
Management of other land uses	633,000		633,000																
Maintenance of improvements	2,766,920		2,766,920																
Forest fire protection	7,661,580		7,661,580																
Construction of improvements	262,200		262,200																
Reforestation	1,223,637			1,223,637															
Range revegetation	719,900			719,900															
Forest rangers, forest supervisors, and other employees engaged in over-all operation and protection	7,440,013		7,440,013																
FIGHTING FOREST FIRES	6,000,000				$6,000,000														
Fire suppression	6,000,000					$6,000,000													
FOREST AND RANGE MANAGEMENT INVESTIGATIONS	3,030,000						3,030,000												
Experimental forests and ranges	2,904,278							2,904,278											
Forest fire control investigations	125,722							125,722											
FOREST PRODUCTS	1,300,000						1,300,000												
Forest Products Laboratory:																			
Conditioning and protection of wood products	292,200								292,200										
Properties investigations and wood products development	391,600								391,600										
Pulp and paper	169,400								169,400										
Chemically converted and derived products investigations	254,400								254,400										
Forest utilization service	192,400								192,400										
FOREST RESOURCES INVESTIGATIONS	880,000						880,000												
Forest survey	802,500									802,500									
Economic investigations	77,500									77,500									
FOREST DEVELOPMENT ROADS AND TRAILS	10,348,000										10,348,000								
Construction	2,098,000											2,098,000							
Maintenance	8,250,000												8,250,000						
FOREST FIRE COOPERATION	9,500,000													9,500,000					
For cooperation with States in forest fire prevention and suppression	9,500,000														9,500,000				
FARM AND OTHER PRIVATE FORESTRY COOPERATION	1,300,000													1,300,000					
Cooperation with States in procurement, production and distribution of forest-tree and shrub seeds and plants	449,200															449,200			
Cooperation with States and private forest owners in forest management service work	744,457																629,657		114,800
Cooperation with States in farm forestry (allotted to Extension Service)	106,343																	$106,343	
SUBTOTAL, Above items for which revisions are proposed	60,123,000	27,490,300	25,519,063	1,971,237	6,000,000	6,000,000	5,322,000	3,096,600	1,325,400	900,000	10,442,900	2,117,200	8,325,700	10,867,600	9,524,900	450,700	635,157	106,343	150,700
ITEMS FOR WHICH NO CHANGES ARE PROPOSED IN THE APPROPRIATION OR ACTIVITY STRUCTURE:																			
ACQUISITION OF LANDS FOR NATIONAL FORESTS - WEEKS ACT	300,000																		
ACQUISITION OF LANDS FOR NATIONAL FORESTS, SUPERIOR NATIONAL FOREST, MINNESOTA	150,000																		
ACQUISITION OF LANDS FOR NATIONAL FORESTS UNDER SPECIAL ACTS (RECEIPT LIMITATION)	142,000																		
Uinta and Wasatch National Forests (Utah only)	40,000																		
Cache National Forest (Utah only)	10,000																		
San Bernardino-Cleveland National Forests (Riverside County, Calif., only)	22,000																		
Nevada-Toiyabe National Forests (Nevada)	10,000																		
Angeles National Forest (Calif.)	20,000																		
Cleveland National Forest (San Diego County, Calif., only)	5,000																		
Sequoia National Forest (Calif.)	35,000																		
COOPERATIVE RANGE IMPROVEMENTS (RECEIPT LIMITATION)	700,000																		
Construction and maintenance of range improvements	700,000																		
TOTAL APPROPRIATIONS (exclusive of permanent appropriations)	61,416,000																		

(a) Salaries and Expenses

	National Forest Protection and Management	Fighting Forest Fires	Forest Research	Total
Appropriation Act, 1951 (Adjusted - see proposed structure, page 338).....	$27,490,300	$6,000,000	$5,322,000	$38,812,300
Reduction pursuant to Section 1214	-333,000	- -	-97,000	-430,000
Activities transferred in 1952 Estimates to:				
"Operating expenses, General Services Administration" for operation and maintenance of buildings	-30,575	- -	-4,500	-35,075
"Salaries and Expenses, Office of Information", for distribution of motion pictures	-4,700	- -	- -	-4,700
Base for 1952	27,122,025	6,000,000	5,220,500	38,342,525
Budget Estimate, 1952	29,655,000	6,000,000	5,345,000	41,000,000
Increase	+2,532,975	- -	+124,500	+2,657,475

SUMMARY OF INCREASES AND DECREASES, 1952

National Forest Protection and Management:	
To provide for administering timber and products sales business involving a total cut of 4.8 billion board feet and performing work necessary to prepare timber sale areas for sale	+1,700,000
To strengthen the prevention, detection, and initial attack phases of fire control	+1,000,000
To expand the range reseeding program	+85,000
Decrease due to providing a direct appropriation to the General Services Administration for certain procurement and leasing costs previously paid from this appropriation	-252,025
Subtotal	+2,532,975
Forest Research:	
For establishing an experimental research center in northern New Mexico and to strengthen the work in Puerto Rico	+48,400
To develop more effective methods of fire control	+35,000
To accelerate the Nation-wide survey of forest resources	+50,000
Decrease due to providing a direct appropriation to the General Services Administration for certain procurement and leasing costs previously paid from this appropriation	-8,900
Subtotal	+124,500

PROJECT STATEMENT

Appropriation and project	1950	1951 (estimated)	Increase or decrease: GSA Adjustment	Increase or decrease: Other	1952 (estimated)
1. National forest protection and management:					
a. Resource protection and use	$25,133,290	$25,300,025	-$247,025	+$2,700,000 (1)	$27,753,000
(1) Timber resource management	(4,334,659)	(4,563,000)	(-44,640)	(+1,700,000)	(6,218,360)
(2) Range resource management	(1,073,123)	(1,001,000)	(-9,800)	--	(991,200)
(3) Wildlife resource management	(147,134)	(136,045)	(-1,330)	--	(134,715)
(4) Water resource management	(75,745)	(49,290)	--	--	(49,290)
(5) Recreation resource management	(620,240)	(617,950)	(-6,050)	--	(611,900)
(6) Management of other land uses.	(639,040)	(638,560)	(-6,250)	--	(632,310)
(7) Maintenance of improvements.	(2,772,179)	(2,738,300)	(-26,790)	--	(2,711,510)
(8) Forest fire protection	(7,712,598)	(7,779,840)	(-76,110)	(+1,000,000)	(8,703,730)
(9) Construction of improvements.	(266,990)	(264,705)	(-2,590)	--	(262,115)
(10) Forest rangers, forest supervisors, and other employees engaged in overall operation and protection..	(7,491,582)	(7,511,335)	(-73,465)	--	(7,437,870)
b. Resource development	1,918,442	1,822,000	-5,000	+85,000 (2)	1,902,000
(1) Reforestation	(1,228,773)	(1,097,068)	(-3,010)	--	(1,094,058
(2) Range revegetation	(689,669)	(724,932)	(-1,990)	(+85,000)	(807,942)
Subtotal	27,051,732	27,122,025	-252,025	+2,785,000	29,655,000
2. Fighting forest fires	7,144,824	6,000,000	--	--	6,000,000
3. Forest research:					
a. Forest and range management investigations ..	2,994,057	3,035,100	-5,500	+83,400 (3)	3,113,000
(1) Experimental forests and ranges	(2,867,519)	(2,908,370)	(-5,500)	(+48,400)	(2,951,270)

(Continued on next page)

Appropriation and Project	1950	1951 (estimated)	Increase or decrease: GSA Adjustment	Increase or decrease: Other	1952 (estimated)
(2) Fire control	(126,538)	(126,730)	- -	(+35,000)	(161,730)
b. Forest products investigations	1,417,237	1,300,400	-400	- -	1,300,000
(1) Forest Products Laboratory	(1,252,594)	(1,114,400)	(-400)	- -	(1,114,000)
Conditioning and protection of wood products	[337,053]	[294,000]	- -	- -	[294,000]
Properties investigations and wood products development	[440,815]	[394,000]	[-400]	- -	[393,600]
Pulp and paper	[179,010]	[170,400]	- -	- -	[170,400]
Chemically converted and derived products	[295,716]	[256,000]	- -	- -	[256,000]
(2) Forest utilization service	(164,643)	(186,000)	- -	- -	(186,000)
c. Forest resources investigations	893,737	885,000	-3,000	+50,000 (4)	932,000
(1) Forest survey	(817,483)	(807,000)	(-3,000)	(+50,000)	(854,000)
(2) Economic investigations	(76,254)	(78,000)	- -	- -	(78,000)
Subtotal	5,305,031	5,220,500	-8,900	+133,400	5,345,000
Unobligated balance	127,912	- -	- -	- -	- -
Total available	39,629,499	38,342,525	-260,925	+2,918,400	41,000,000
Available from subsequent year	-367,824	- -			
Transfer in 1951 estimates from: "Research and Marketing Act of 1946, Department of Agriculture"	-254,677	- -			
Transfer in 1952 estimates to: "Forest Development Roads and Trails, Department of Agriculture"	+97,000	+94,900			
"Forest Fire Cooperation, Department of Agriculture"	+25,500	+24,900			

(Continued on next page)

Appropriation and Project	1950	1951 (estimated)
"Farm and Other Private Forestry Cooperation"	+19,200	+42,900
"Operating expenses, General Services Administration"	+35,075	+35,075
"Salaries and Expenses, Office of Information, Department of Agriculture".....	+3,727	+4,700
Reduction pursuant to Section 1214...	- -	+430,000
Total appropriation or estimate	39,187,500	38,975,000

INCREASES

(1) An increase of $2,700,000 under the project "Resource protection and use" as follows:

(a) An increase of $1,700,000 to provide for administering timber and products sales business involving a total cut of 4.8 billion board feet and performing work necessary to prepare timber sale areas for sale.

Need for Increase: The Forest Service conducts the largest single timber sale business in the world. This business accounted for a cut of 3.5 billion board feet in the fiscal year 1950, roughly the equivalent of 10 percent of national lumber production, with a value of 30.7 million dollars. The commercial timber stand of the national forests including Alaska is approximately 600 billion board feet, which is roughly one-third of the total commercial timber stands of the Nation.

Since early in the calendar year 1950, the demand for national forest stumpage has been increasing. Both the rate of cutting and new sales surged upward in the first half of the year due to improved domestic demands, particularly for housing. Since the Korean crisis, demands for national forest stumpage have increased even more rapidly. Unprecedented competitive bidding for national forest timber offerings occurred in the first half of the fiscal year 1951 which is evidence of the demand for national forest timber and the lack of private timber available for purchase by many established mills.

The planned cut for the national forests in the fiscal year 1951 is 3.8 billion feet. The cut for the first quarter of 1951 set a new record high of approximately 1.5 billion feet. At current rates of cutting it is quite possible that a total of almost 4 billion feet will actually be cut in 1951.

Increases in stumpage prices are expected to raise the average value of timber cut from $8.77 per M in 1950 to the neighborhood of $10 per M in 1951. The total value of timber cut in 1951 should therefore be approximately 40 million dollars.

Since the Korean crisis, lumber demand has exceeded supply. Lumber is on the critical list of materials needed for national defense. Clearly, all feasible measures to increase the supply of lumber are urgently needed. The National Security Resources Board has requested that the national forest timber cut be increased.

The increase proposed is for the purpose of increasing the rate of sales of national forest timber in accordance with sound cutting and sustained-yield management as rapidly as possible. The results would be (1) an increase in national lumber production, which is badly needed, (2) improvement of the national forest property through removal of elements of the stand which should be cut to improve growth rates, and (3) a substantial increase (approximately $10,000,000 at current prices) in returns to the Treasury from the national forest timber business.

Plan of Work: The requested increase of $1,700,000 would be expended for administration of an increased cut of 1 billion board feet and for advance preparation of timber for sale including essential management planning, detailed examinations of the areas, planning the supplementary road systems to be constructed by the purchaser, determining how the timber is to be cut, appraising the timber, and preparing the contracts and advertisements for 2 billion board feet of timber. This rate of sale-preparation work is absolutely necessary if the higher level of cutting of over 4.8 billion feet annually is to be maintained on a businesslike basis.

(b) An increase of $1,000,000 to strengthen the prevention, detection, and initial attack phases of fire control.

Need for Increase: Plans made by the best informed corps of experts in control of forest fires show that 10,500 men are needed during the height of the fire season to make sure that fires that start on National Forest lands are detected before they become large and are attacked by a suppression force adequate in strength to assure control. These plans call for the placement of lookouts to permit discovery of more than 90 percent of the fires before they have burned 1/4 acre. To assure control of more than 10,000 fires each year before great damage results, these plans call for about 40 percent of all lightning fires to be attacked within one hour, 65 percent within two hours, 80 percent within three hours with most all lightning caused fires being attacked within five hours following discovery and report. Since man-caused fires occur at lower elevations where the fuels are drier and rates of fire spread are higher, the plans call for attack on approximately 75 percent of such fires in 30 minutes, 95 percent within one hour, with the remainder to be attacked within two hours following discovery.

In some areas chances are good that one man working alone can control a fire if he can reach it soon enough after it starts; in other areas it takes two to five men to assure control while still small, even though

they get there just as fast. The fuels, topography, incidence of location and meterological elements combine to make fires in many areas difficult to handle.

These and many other elements of planning, including those involving the prevention of fires, were considered during the preparation of the fire plans for the National Forests. In all cases the controlling principle in planning was "successful control of fires at least cost to the public and with a minimum of damage to the natural resources of timber, forage, water, recreation, etc."

Present organization inadequate: The organization that can be provided with the funds now available for fire protection has left too much to chance in the control of fires. For example, 50 percent of all lightning fires are not discovered until six hours or more after they have started. Detection time for man-caused fires, which usually occur when it is drier and in more dangerous fire areas measured by the possibility of rapid spread, must be much shorter. Yet 46 percent of all such fires remain undiscovered for an hour or more after they start.

Fires are not being attacked soon enough after they are discovered. For example, it takes more than one hour after it has been determined that a fire exists to place men and equipment on 65 percent of the lightning fires. The situation with respect to the man-caused fires is more favorable since they are usually more accessible and are attacked more quickly following discovery. But such fires usually occur during much worse burning conditions, in areas of more dangerous fuels, and require much faster action. Yet for lack of near-by fire fighters over one-sixth of these fires continue to burn unchecked for more than one hour after they are reported.

Also strength of attack due to lack of available forces is wholly inadequate in a high percentage of cases. In too many cases one man is sent when two are desperately needed to effect control; 2 men when 3 to 4 men are needed, etc.

Increased costs of operation: The present organization is inadequate even though funds appropriated for fire control for fiscal year 1951 are greater than for any previous year of record. Primarily, this is because of increased costs of operation. For example, $120 per month would employ a lookout for seven days per week in 1940; in 1951 because of various wage increases and the institution of the 40-hour week during the interim by law, it costs $265 per month to assure a 6-day week - $326 per month if detection is to be maintained 7 days per week as is the case during most of the fire season in the western national forest regions. Fires are no respectors of days in the week. Over-all it takes two dollars in 1951 to buy the same fire services including personnel, equipment and material that one dollar would buy in 1940; $1.66 in 1951 to buy the same services that one dollar would buy in 1944.

Increased costs and other factors have seriously affected the strength of the fire organization in terms of the number of men employed. During 1934 appropriated funds permitted the employment of 3,334 men for the fire organization. However, during that year 10,179 men from the CCC camps were used as fire guards making a total of 14,566 men available for fire

prevention, detection, and initial attack. Following the abandonment of the CCC forces, the number of men available for fire control was reduced but was still at the high figure of 9,477, about 1,000 men less than the planned needs. Since then, in spite of some increase in appropriations, increasing costs have progressively reduced the number of men available for fire control until the fire organization has decreased to the level of 6,064 men in fiscal year 1951, about 8,500 below the number available in 1934, and 3,000 below the strength of the fire organization in fiscal years 1944 and 1945. The organization is presently 4,500 men below planned needed requirements.

During 1950 numerous fires did great damage to important watershed and timbered areas. Many reached a size of 10,000 to 60,000 acres. More than $6,000,000 was spent in the control of such fires. Damage to resources was very great. One fire of 25,000 acres on the Stanislaus Forest in California killed millions of feet of virgin timber and, probably worse, completely destroyed a fine pole stand 30 to 60 years old.

Unless planted, which will cost in the neighborhood of $1,000,000, much of this excellent timber growing site will revert to a brush field in a few years. Heavy watershed damage has resulted from fires burning over extensive acreages. Although a complete figure of damages are not yet available, it is estimated that damages in excess of $10,000,000 resulted from the fires on national forests in 1950. Together with the cost of suppression the damage figure totals about $16,000,000.

The Federal Office of Civilian Defense in collaboration with the military have requested the U. S. Forest Service to prepare operational fire plans to cope with potential unconvential fire attack on wild lands by an enemy. They recognize these wild lands furnish most of the water for domestic, irrigation and hydroelectric purposes; that lumber and forest products essential to our domestic economy come from these lands; also important is the forage available to domestic stock and wildlife and the recreation to large segments of our population. The national forests support more than 34 percent of the total saw timber supply in the United States and a high percentage of much of the other important national resources.

All such resources are subject to destruction by fires unless a fire organization is available to control them before they reach the runaway stage.

The value of these resources to the National economy in peacetime, the great importance the military attach to them, and the lack of manpower facilities to control the fires normally experienced each year warrants an increase for this purpose. This increase would permit about 1,200 additional seasonal fire guards, would increase the number available for fire control from about 6,000 to 7,200, still short of planned needs by about 3,300 men during the height of the fire season.

Plan of Work: The requested increase would be employed chiefly to increase the number of lookouts, smoke chasers and suppression crew men. Average length of employment for each man employed will be less than four months each year.

(2) An increase of $85,000 under the project "Resource development" to expand the range reseeding program.

Need for Increase: The increase would be used to expand the reseeding work in localities where the job is already under way and in other localities where no work has yet been done. Northern New Mexico is a good example of the latter where it has been found that much of the land hitherto thought not suitable can now be successfully reseeded. Moreover, the work would be of untold benefit to hundreds of Spanish-American permitees whose allotments are small but which would have to be reduced further in order to balance numbers of livestock with safe grazing capacity.

Public Law 348 (81st Congress) authorized the appropriation of sufficient funds on a year-to-year basis to complete the national-forest range reseeding program in fifteen years. The $85,000 increase would reseed about 9,000 additional acres of denuded range land. Based on past results this sould increase needed production, providing better than 5,000 to 8,000 additional cow months of grazing capacity on areas which are now so badly depleted as to be of no practical value in range-management planning.

(3) An increase of $83,400 under the project "Forest and range management investigations," as follows:

(a) An increase of $48,400 to initiate research at experimental forests and ranges in northern New Mexico and to strengthen the research in Puerto Rico.

Need for Increase: This increase is required to initiate studies in northern New Mexico and to strengthen research in Puerto Rico, as first priority in the national research program presented a year ago.

The proposed studies in northern New Mexico would serve a 40 million acre province embracing the headwaters of the Rio Grande, Pecos and Canadian Rivers, the results of which would have value in southern Colorado, northwestern Texas and Oklahoma, and northeastern Arizona. Many critical forest and range problems exist in this area. Heavy grazing of the past has greatly deteriorated the forage and soil resources, impairing irrigation and other watershed values. Unwise cutting of timber has also curtailed productive capacity and adversely influenced watersheds. The adverse effects of resource deterioration is not confined to northern New Mexico, but millions of dollars of downstream improvements, such as reservoirs and irrigation structures, are endangered by floods and siltation. A large population of Spanish-Americans and Indians live on small ranches which provide a sub-standard living. Studies of range, watershed and timber management and improvement offer possibilities for overcoming deteriorating forces, improving resource values, and the welfare of the dependent population. The longer such studies are delayed the more serious the situation can become. The Federal Government administers 18 of the 40 million acres and its responsibility in regaining the productive potential of the land is large. Such leadership is required to point the way for restoration and sustained utilization of the range, timber, and water resources.

In Puerto Rico and the surrounding Caribbean region the forests have deteriorated, in both quality and quantity. Of the more than 500 native species in Puerto Rico, only 35 are found in the United States. Seven distinct timber types are present, ranging from rain and dwarf forests in the mountains to the cactus and mesquite shrub types on the southwestern coast. The speeding up of the solution of the problems involved in developing techniques of reforesting and growing timber crops is of pressing importance on an island where the concentration in population is approaching 700 per square mile. This small research unit is increasingly being called upon to serve as a center for the dissemination of knowledge in the forestry field between the United States and its Central and South American neighbors. Present funds available are totally inadequate to meet these needs.

Plan of Work: Qualified technicians and specialists will be employed and assigned to individual projects where their knowledge will contribute the most toward the solution of the problems of the province. Most of the field activities will be conducted on experimental forests and ranges selected for their representativeness. Close contact will be maintained with other Federal agencies, and interested State and Insular institutions, public and private organizations, and individuals.

(b) An increase of $35,000 for investigations to develop more effective methods of fire control.

Need for Increase: The Nation's cost for fighting 194,000 forest, brush, and grass fires and from preventing a much larger number from starting, was over 50 million dollars in 1949. Damage was estimated at 43 million dollars from a total acreage burned over of 15 million acres, an area the size of the States of Massachusetts and New Jersey combined. Many billions of dollars of value in natural resources and property were threatened by these 194,000 fires, yet the season was not of unusual severity. In 1950, on the basis of incomplete reports, the losses are much more severe. These facts illustrate the size of the problem. It prevails in all sections of the country and is of sufficient magnitude to be important both to the National economy and to National defense.

Research in better ways to reduce the threat of conflagrations from these outdoor fires and in how to reduce costs, is a task worthy of the best that scientific research can offer. But so far this part of the job has been neglected. The total funds available for the purpose throughout the country amounted to only $125,000 in the fiscal year 1950 and even less in 1951. The modest investments in this work to date rank very high in the striking progress they have produced in forest fire control and in direct monetary return to the public. Research required to speed up and expand such service to meet urgent civil and military needs is already well analyzed and ready for action.

Plan of Work: This investigative work is headed up in the Division of Forest Fire Research in the Office of the Chief of the Forest Service, and projects would be carried out as assigned at regional forest experiment stations or, where appropriate, by joint participation of the administrative and research organizations, or by cooperative arrangement with state and other interested agencies. A few phases of the modern fire problem to which the increase would contribute are listed:

The problem of the big fire: Under most circumstances the wild land fire that has gained momentum still defies the best fire fighting methods that have yet been developed. The most common reason is inability to foresee how the big fire will behave. The behavior of small fires has been carefully studied and can usually be predicted quite accurately. Such studies have provided most of the information for training forest fire fighters. But the large fire is too often unpredictable. Unexpected behavior of the large fire is critical. It endangers the lives of fire fighters and often results in disastrous conflagrations that become calamities. The reasons for unexpected behavior of large fires are often obscure. Skillful fire fighting service requires that investigations be conducted of the development or existence of atmospheric instability in the vicinity of a large burning area, the accumulation at times of explosive gases, and the peculiarities of the pattern and velocity of air currents set up by the smoke and hot air over a large fast burning fire. Any and all new facts on these factors can provide new safeguards to the fire fighter and reduce the number of public disasters each year.

Use of chemicals and wetting agents: Improved transportation systems and increasing mechanization in forest fire fighting have made it possible to use water more commonly in forest fire fighting. But compared to the city hydrant the supply is always limited and often very precious. The use of wetting agents and chemicals to extend the extinguishing effect of water and to shorten the time required for complete control of a fire, offers opportunities for greatly increasing efficiency and reducing costs. A saving of even 5 percent in the time required to fully extinguish forest fires with water would finance the entire research program for several years. The forest fuels and the behavior of wild fire burning in them are so different from those in industrial and municipal experience that painstaking selection and adaptation is essential before the potential value of such agents can be realized.

Aerial methods in fire control: The use of air planes and parachute fire fighters has already enabled striking improvement in the control of lightning fires in inaccessible country. The helicopter offers further opportunity to develop effective aerial methods for facilitating all phases of fire fighting operations, and may make it possible to attack fires effectively directly from the air. Adaptation of aerial bombing techniques to successful control of fires also needs further study, as does the substitution of aerial methods of detection of fires for the more conventional system of detection from fire lookouts.

(4) An increase of $50,000 under the project "Forest Resources Investigations" to accelerate and intensify the Nation-wide survey of forest resources.

Need for Increase: The recommended increase for the Forest Survey is to obtain more adequate information on timber supplies and timber requirements as a basis both for preparation of emergency plans to sustain production of numerous strategic timber products, and for long-term forestry programs of public agencies and private timber owners. The increase would permit special inventories of species in critical supply and intensification of drain and requirements phases of the Survey. Resurveys in important timber regions surveyed during the early 1930's would be speeded up, and all surveys

intensified to obtain more reliable and localized information. The plans are in accordance with the expanded authorization for the Forest Survey contained in Public Law 128 (81st Congress). Local cooperation with State agencies, private industries, and others would be encouraged to the fullest extent possible in order to meet both national and local needs for comprehensive information on timber resources.

Initial surveys to date have covered about 420 million acres of forest land, or 67 percent of the Nation's total forest area. The remaining area of about 200 million acres of unsurveyed forest land includes large areas of old-growth softwood timber in the West and the young-growth hardwood forests of the Northeast and Central States. Resurveys since the war have covered about 100 million acres, or one-third of the area first surveyed during the 1930's.

Coverage of unsurveyed areas and early completion of resurveys of important areas such as the Southern pine and Douglas-fir regions are urgently needed as a basis for production policies of war agencies, wood-using industries, forestry agencies, and land owners. Intensification of the Survey is considered essential to meet needs for information of many strategic timber items such as high-grade sugar maple and white oak, veneer grades of yellow birch and yellow poplar, high-grade ash and hickory for fabricated products, quality grades of Douglas-fir, and a large number of other species and timber products. The comprehensive information provided by the Forest Survey on timber areas, volume and quality of standing timber, industrial capacity, and requirements of wood-using industries and consumers of timber products is basic to production-expediting programs relating to location of access roads - for example, expansion of plant facilities, and procurement of essential timber products.

Plan of Work: The requested increase would be used to speed up and intensify surveys to obtain information on the volume, accessibility, supplies and requirements for critical species and products needed for strategically important uses. Forest resurveys would be speeded up in the Douglas-fir region of the Pacific Northwest, the Lake States, and the South. Nationwide studies of timber requirements for various end uses likewise would be intensified to indicate supply-requirements problems and means of overcoming timber products shortages.

Surveys are being carried out mainly by the Regional Forest Experiment Stations, in most cases under cooperative arrangements with State Forestry Departments and other local agencies and timber industries. Use of additional photo interpreters and other technicians will make possible increased efficiency of the Survey. The requested increase would permit total coverage of about 40 million acres by initial and resurveys in 1952. Supply and requirements information obtained by the Survey would be issued promptly in various reports, type maps, and correspondence.

CHANGES IN LANGUAGE

The estimates include proposed changes in the language of this item as follows (new language underscored, deleted matter enclosed in brackets):

For expenses necessary, * * * to erect necessary buildings: Provided, That the cost of any building purchased, erected,
1 or as improved, exclusive of the cost [(not to exceed $1,000)] of constructing a water-supply or sanitary system and of connecting the same with any such building, and exclusive of the cost of any tower upon which a lookout house may be erected, shall not exceed $15,000, with the exception that any building erected, purchased, or acquired, the cost of which was $15,000 or more, may be improved out of the appropriations made under this chapter for the Forest Service by an amount not to exceed 2 per centum of the cost of such building as certified by the
2 Chief of the Forest Service [, and that not to exceed $8,000 may be expended for the installation of an elevator in the Yeon Avenue warehouse in Portland, Oregon]; * * *

3 [General administrative expenses: For general administration, including expenses of the National Forest Reservation Commission as authorized by section 14 of the Act of March 1, 1911 (16 U.S.C. 514), $665,000.]

National forest protection and management: For the administration, protection, use, maintenance, improvement, and development
4 of the national forests, * * * <u>expenses of the National Forest Reservation Commission as authorized by section 14 of the Act of March 1, 1911 (16 U.S.C. 514)</u>; * * * and all expenses necessary for the use, maintenance, improvement, protection, and general administration of the national forests, [$27,100,000] <u>$29,655,000</u>, of which not to exceed $75,000 shall be available for the purchase
5 of three nursery sites [, and not to exceed $5,000 shall be available for the purchase of administrative sites].

6 <u>Forest research: For forest research at forest or range experiment stations, the Forest Products Laboratory, or elsewhere, in accordance with the provisions of sections 1, 2, 7, 8, 9, and 10 of the Act approved May 22, 1928, as amended (16 U.S.C. 581, 581a, 581f-581i), including the construction and maintenance of improvements; fire, silvicultural, watershed, and other forest investigations and experiments; investigations and experiments to develop improved methods of management of forest and other ranges; experiments, investigations, and tests of forest products; a comprehensive forest survey; and investigations in forest economics; $5,345,000.</u>

[Forest research: For forest research in accordance with the provisions of sections 1, 2, 7, 8, 9, and 10 of the Act approved May 22, 1928, as amended (16 U.S.C. 581, 581a, 581f-581i), including the construction and maintenance of improvements, as follows:]

[Forest and range management investigations: Fire, silvicultural, watershed, and other forest investigations and experiments under said section 2, as amended, and investigations and experiments to develop improved methods of management of forest and other ranges under section 7, at forest or range experiment stations of elsewhere, $3,030,000, of which $41,000 shall be available for such investigations and experiments at Bartlett Experimental Forest only.]

[Forest products: Experiments, investigations, and tests of forest products under section 8, at the Forest Products Laboratory, or elsewhere, $1,300,000, of which $30,000 shall be made available for the establishment of a forest utilization service unit in the Southwest.]

[Forest resources investigations: A comprehensive forest survey under section 9, and investigations in forest economics under section 10, $880,000.]

The first change proposes deletion of the language limiting the cost of water-supply and sanitary systems since inclusion of a specific limitation is unnecessary. For many years the Forest Service has been operating under a limitation of $450, plus an authorization of $8,000 annually which could be applied to any situation where the $450 limitation proved inadequate. In only one year since 1925 has the authorization of $8,000 been fully used. Under these conditions it does not appear to be necessary to apply a limitation to water-supply and sanitary systems. While the $1,000 limitation now carried in the appropriation act will prove to be adequate in 99 percent of the cases, a few situations may develop, especially in the Southwest, where such a limitation would make it impossible to establish a ranger station at the proper location because of expensive well drilling costs. The Act of April 24, 1950 (Public Law 478), repealed the acts which established the $450 limitation and the $8,000 authorization.

The second change proposes to delete the non-recurring authorization provided in the 1951 Act for the installation of an elevator in the Yeon Avenue Warehouse at Portland, Oregon, as retention of the provision is no longer necessary.

The third change in language proposes deletion of the subappropriation item "General administrative expenses", and the consolidation of funds presently carried under this item with other applicable appropriations of the Forest Service. This change is proposed for the sole purpose of simplifying the appropriation structure and administration of the Service, and will in no way affect the nature or scope of the work conducted.

The fourth change in language is for the purpose of including under the subappropriation item "National forest protection and management" the language previously carried under the item "General administrative expenses" authorizing the payment of expenses of the National Forest Reservation Commission.

The fifth change in language proposes deletion of the authorization making available not to exceed $5,000 for the purchase of administrative sites. Section 13 of the Act of April 24, 1950 (Public Law 478) authorizes the expenditure of not to exceed $25,000 annually for this purpose, therefore, specific authorization in the appropriation act is no longer necessary.

The sixth change in language proposes consolidation of the subappropriations "Forest and range management investigations", "Forest products", and "Forest resources investigations" into a new single subappropriation item "Forest research". This consolidation is proposed for the sole purpose of simplifying the appropriation structure and administration of the Service, and will in no way affect the nature or scope of the research work conducted.

Authorizations contained in the 1951 Appropriation Act specifying $41,000 for investigations and experiments at the Bartlett Experimental Forest, and $30,000 for the establishment of a forest utilization service unit in the Southwest are proposed for deletion under the new subappropriation "Forest research". The specific authorizations are unnecessary since an equitable allocation of funds will be made to these activities to the extent permitted within total funds provided under this item.

STATUS OF PROGRAM

Current Activities: The purpose of this National Forest Protection and Management program is to manage, protect, and develop the national forests and insure that timber, water, range, recreation, wildlife, and other resources are utilized in a manner so as to best serve the Nation.

The economic importance of the national forests will be realized when it is considered that:

a. They provide a source of forest products in emergencies and a measure of assurance for a future timber supply. The rapid depletion of timber on private lands causes the national forests to assume increased importance as a source of timber. The annual allowable cut from the national forests is 6,000,000,000 board feet. At present approximately two-thirds of the allowable cut is being harvested. This is approximately 10 percent of the annual lumber production in the United States.

b. The area within the national forest boundaries is equivalent to some 10 percent of the area of the continental United States.

c. In addition to the services rendered for which cash receipts are not collected, the national forests produced a cash income to the Federal treasury, in the fiscal year 1950, in excess of 34,000,000 dollars.

d. They provide range for some 10,000,000 head of domestic livestock.

e. They provide protection to municipal water supplies for nearly all western cities and towns and many in the East, and to irrigation water used on some 20,000,000 acres of western lands, as well as to many streams with water power developments. They provide flood protection to thousands of acres of rich valley lands and prevent the siltation of reservoirs and stream channels.

f. They provide a habitat for a large part of the big game animals, birds, and for millions of small game animals and furbearers.

g. They provide opportunities for healthful outdoor recreation, with a minimum of restrictions, for the millions of people who yearly visit the national forests.

h. Nearly 4,000,000 people who live in and near the national forests are supported in whole or in part through the management and utilization of the forests and their resources.

National forest boundaries encompass an aggregate area of 228,000,000 acres reaching geographically into 40 States, Alaska, and Puerto Rico, of which 181,204,638 acres are under Forest Service administration. Many tracts of privately owned lands are interspersed within the Federal holdings.

National forests are managed under the multiple use principle with practically all areas used for, or serving, more than one purpose or objective. For example, 50 percent of the area within the national forests of the continental United States serves five different purposes: (1) timber production, (2) watershed protection, (3) forage production, (4) wildlife production, and (5) recreation. An additional 28 percent serves four purposes in varying combinations. Of the remainder, 21 percent of the total serves three purposes with only 1 percent of the total reserved for one purpose exclusively, mainly campgrounds and special use areas such as summer home sites, pastures, corrals, etc.

The varied interests which inevitably conflict and which must be reconciled, the vast areas covered, and the unusual complexities, clearly demonstrate the necessity of careful planning for, and skillful management of, the national forest properties.

The protection of national forests from fire and trespass is made difficult by the large area to be protected, the general inaccessibility of the national forests, the many thousands of miles of exterior boundary, and the impossibility of taking preventive action when dealing with such a problem as lightning-caused fires (more than 4,000 in the calendar year 1950).

Selected Examples of Recent Progress:

1. Resource Protection and Use:

Receipts deposited to the "Forest Reserve Fund" in the fiscal year 1950 increased $2,420,210 over the fiscal year 1949. The following table summarizes the receipts data for the fiscal years 1949 and 1950:

Forest Reserve Fund	1949	1950	Change
Timber	$26,926,449	$29,380,134	+$2,453,685
Grazing	3,275,964	3,385,068	+109,104
Land Use, Power, etc. ...	872,908	830,329	-42,579
Subtotal	31,075,321	33,595,531	+2,520,210
Suspense Account, Alaska 1/	132,310	77,148	-55,162
Special Account, O&C Lands 2/	783,631	868,324	+84,693
Total receipts	31,991,262	34,541,003	+2,549,741

1/ Suspense account established pending settlement of Indian rights on Tongass Forest, Alaska.

2/ Special account established pending determination of the custody of certain lands in Oregon.

Net area of lands under Forest Service administration increased from 180,894,734 acres as of June 30, 1949, to 181,204,638 acres on June 30, 1950, or 309,904 acres.

Timber Sales. During fiscal year 1950 the volume of timber cut from the national forests was 3,501,937,000 board feet. This constituted a decrease of 238,873,000 board feet from the previous year's level. Value of this cut amounted to $30,714,292, exceeding that of fiscal year 1949 by $1,965,285. The year started with uncertain markets. These uncertainties disappeared over the winter and with spring came sharply increased activity and a rate of cutting in excess of that for the comparable period in fiscal year 1949. In the fourth quarter of the fiscal year the cut of timber was 28 percent greater than in the final quarter of the previous fiscal year.

The year ended with a strong demand for stumpage which continued into the fiscal year 1951. The average stumpage price of timber cut in the fiscal year 1950 was $8.77 per M, an increase of $1.09 per M over the value of timber cut in fiscal year 1949.

Timber sale funds not required for sales administration as a result of the reduced cut in fiscal year 1950 were used to exceptionally good advantage in preparing areas for sale. This advance preparation made possible prompt offerings of timber with the upsurge in the market, and con tributed toward making possible the largest cut of national forest timber in any 3-month period when 1,483,646,000 board feet were cut in the first quarter of fiscal year 1951 as compared with 1,065,415,000 board feet cut in a comparable period in fiscal year 1950. Timber values also showed a spectacular rise as indicated by $23,542,395 in receipts for the first 5 months of fiscal year 1951 as compared with $13,292,430 for a comparable period in fiscal year 1950.

Fire Control. The 1950 fire season to November 30 proved very serious for the national forests of New Mexico, Arizona, California, and the Southeastern States. Fire conditions for national forests of other States were normal during this period.

More than the normal number of fires occurred in the national forests of the Southeastern States. These fires burned approximately 40,000 acres of timber producing lands.

The fire season in New Mexico and Arizona opened a month earlier than usual. Although the number of fires that started was about average for the period, losses to natural resources were heavy. The area burned to November 30 was ten times that of the previous year and 10,000 acres more than the previous 5-year average.

The most critical fire situation developed in California. The 1950 fire season in the national forests of that State was more severe than any experienced since 1924. Loss of timber resources was very high; watershed damage and damage to other resources was extensive. The area burned over contained some of the finest timber growing lands in the State. More than 150,000,000 feet board measure of timber was destroyed. More serious was the large acreage of reproduction and

advanced second growth destroyed. This area of producing timberlands should be planted within 5 years or much of it will revert to a brush field that will prove very difficult to recapture as a timber growing site in future years.

The area of national forest lands burned over in California to November 30 is about three times that burned over in 1949 and about four times the last 5 years' average.

Approximately 80 percent of all national forest lands burned over to November 30, 1950, was confined to California, New Mexico, and Arizona.

Statistical data on the 1950 fire season to November 30 follow:

	1949	1950
Number of lightning fires	6,067	4,468
Number of man-caused fires	5,154	5,268
Total number	11,221	9,736
Number of fires exceeding 10 acres in size	1,187	1,266
Area of lands burned over inside the exterior boundaries of the national forests	188,332	322,895

Grazing Use. In calendar year 1949, 4,291,489 head of livestock were permitted on the national forests, or 6 percent less than in 1948. Grazing receipts for fiscal year 1950 went up to $3,385,068.41, an increase of 3.33 percent over fiscal year 1949. About 80,000,000 acres of national forest land are grazed.

These lands and these livestock contribute importantly to the national defense program in supplying meat and wool. A most important job is to bring the number of livestock in balance with range capacity and keep it there so as to provide permanently a dependable source of forage for maximum numbers. There are two ways to do this—reduce numbers or increase capacity. The latter can be accomplished, to the extent permitted by available resources, through range surveys, management plans, fencing, water developments, and control of distribution of stock and trespass.

Maintenance of Improvements. The total estimated cost of maintaining the $111,000,000 cost value in existing improvements on the national forests (exclusive of roads and trails) is $3,878,851 as evidenced by the table which follows this paragraph. Funds obligated for maintenance in 1950 were approximately 70 percent of this amount. Thus, the maintenance program was based on a relative priority selection of the most urgent projects such as key telephone lines, lookout towers, fences, etc. Even on these improvements full maintenance was not given

in order to spread the available funds over as many projects as possible. The inevitable deterioration of improvements because of improper maintenance is minimized by this procedure. Rising costs have also contributed to the backlog of maintenance work that is currently not being financed.

A tabulation of improvements in existence is given below:

IMPROVEMENT	No. of Units (Miles or No.)	Unit Costs	Total Annual Cost of Maintenance
Telephone lines	50,438	$12.72	$641,571
Fire breaks	5,109	80.61	411,836
Airplane landing fields	63	331.90	20,910
Lookout houses, towers, and observatories	2,944	77.25	227,424
Pump sets	530	25.62	13,578
Dwellings, headquarters	1,038	184.75	191,770
Dwellings, temporary stations ..	2,283	75.33	171,978
Offices, all	732	101.25	74,115
Barns, garages, and warehouses .	2,381	66.45	158,217
Fences, headquarters	1,141	52.02	59,355
Fences, temporary stations and plantations	2,834	17.62	49,935
Water development projects, headquarters	1,191	48.09	57,275
Water development projects, temporary stations	928	22.35	20,740
Gas and oil storage	103	53.14	5,473
Sanitary systems	2,263	20.22	45,758
Light, power, and central heating plants	208	62.26	12,950
Bunkhouses, barracks, etc.	673	78.50	52,830
Other improvements, headquarters	3,098	24.55	76,056
Other improvements, temp. sta. .	3,752	9.03	33,881
Range fences and corrals	22,804	16.81	383,335
Stock driveways, range (includes bridges)	6,292	9.61	60,466
Water developments, range	13,282	12.87	170,940
Campgrounds, public service	3,629	123.45	448,000
Campground buildings	5,469	37.81	206,783
Water systems, campgrounds	4,502	15.42	69,420
Dams, all types	261	145.27	37,915
Special use facility areas	584	24.80	14,483
Other improvements, misc.	—	—	161,857
Total			3,878,851

Construction of Improvements. Funds obligated for construction (exclusive of roads and trail improvements) in the fiscal year 1950 were $266,990. This amount was used to take care of the most critical requirements for replacement of the existing plant of $111,000,000, cost value, and for urgent additions to plant--primarily for housing. Priority generally has been given to housing for the lower-salaried forest officers headquartered in small communities and isolated locations where rental housing was not available.

Wildlife Use. Hunters, fishermen, and others interested in wildlife are depending more and more on the national forests. This has resulted from the gradual closure of private lands to hunting and fishing and the fact that the national forests comprise the largest area of high-quality wildlife lands remaining open to the public. As a consequence, management activities which are necessary to keep the national forest lands productive of wildlife are conducted. Of particular importance in this connection is the cooperative work between the Forest Service and the various States.

The cooperative work is basic to the development and proper management of the national forest wildlife resource because of the dual responsibility for wildlife management on national forests. Through State laws the State gives leadership in protection and utilization of the wildlife resource. The Forest Service manages the land in the national forests. Moreover, the Forest Service must coordinate wildlife management with the other multiple use resource management activities of the Forest Service.

The new cooperative wildlife management program on the Allegheny National Forest in Pennsylvania finished its first year of operation and was widely acclaimed as one of the most successful programs of its nature. The work on this forest included extensive wildlife habitat development. The older cooperative programs in such States as Virginia, West Virginia, North Carolina, Alabama, Tennessee, Georgia, and Arizona continued to expand. The principles of operation of these older programs, though variable in different States, have generally developed on a sound basis and have the approval of the public. In many instances these cooperative programs have resulted in good hunting and fishing where 15 years ago none existed. For example, on the George Washington National Forest in Virginia it was estimated that 1,400 whitetail deer, 500 turkeys, and 130 black bear were killed during the past year on areas that 15 years ago contained none, or but few, of these species.

Though special cooperative management units have not developed in the West to the extent desired, there has been a very favorable trend in increased cooperation that involves consultation and study of such problems as big game surpluses and habitat improvement. Notable examples are the special joint planning meetings held by forest officers and State men in Utah, Colorado, and Idaho.

Big game populations are relatively stable. This may mean that ranges are now fully or overstocked and possibly that some overpopulation areas are being brought under control. There is evidence in a few

States, Utah and Colorado for example, that on local areas this latter possibility may be the case. Nevertheless big game overpopulation problems still exist and are an important administrative problem. Then too, there are thousands of acres of national forest land in the Lake States and elsewhere where underharvesting of the deer herd has left so many surplus and hungry deer in the woods that tree reproduction is eaten and a new forest cannot be grown.

Evidence of the increased use of national forest lands is furnished by a comparison of the estimates of the wildlife users for the fiscal years 1949 and 1950. The estimated number of hunters increased from 1,720,000 in fiscal year 1949 to 1,950,000 in fiscal year 1950. Fishermen increased from 2,960,000 to 3,160,000 during the same period.

Recreation Resource Management. During the calendar year 1949, public use of the national forests, exclusive of highway travel, amounted to 26,100,000 visits. This is an increase of 9 percent over the 24,000,000 visits reported for 1948.

Visits to camp and picnic grounds and at organization camps increased from 10,431,000 in 1948 to 11,783,000 in 1949, or 13 percent.

Recreational use of 236 winter sports areas suffered a temporary decline due to extreme weather conditions in many parts of the country. Over 1,700,000 visits were reported, however, in calendar year 1949.

Use of other national forest areas, such as resorts, summer homes, and wilderness areas, as well as the use made of the national forests for hunting and fishing, generally showed a substantial increase.

Overuse, and the fact that practically no new areas have been developed since World War II, plus the deteriorated condition of many areas, are making maintenance of the limited existing facilities more difficult and costly.

Efforts are being made to obtain greater participation by local communities in the management of national forest campgrounds, and in increasing the number of concessionaire-operated installations, in order to reduce the burden of maintenance on the Federal Government.

Miscellaneous Lands Activities. Special use permits covering the use and occupancy of national forest lands for private, public, and semipublic purposes were held by 49,806 permittees in fiscal year 1950. Of this number some 28,766 were charge-permits which produced a revenue approaching $632,031 . Between 12,000 and 14,000 new permits are issued each year, as compared to 8,000 or 9,000 expirations or revocations. Fiscal year 1950 receipts from charge-special-use permits and mineral receipts from acquired lands amounted to $750,862. The demand for summer home lot permits, especially in California where there are some 8,000 unfilled applications, has exceeded the ability of the Forest Service to plan, locate, and survey such lots. There are 16,024 charge summer home lot permits in force—an increase of 1,021 over the previous year.

The new fee schedule based on percentage of "net sales" for commercial use of national forest land, which was placed in effect on January 1, 1949, has resulted in many protests from special use permittees operating resorts, ski lifts, stores, and similar enterprises. A study has been made to determine whether the protests are justified. Pending final consideration, fees paid under protest have been placed in a special deposit account.

Mineral permits and leases on acquired lands are now issued by the Bureau of Land Management, but the Forest Service is required by law to report on all applications and to consent to issuance of permits and leases. Examination of title and status records is involved and is a particularly time-consuming job. During the fiscal year 1950 approximately 600 cases required some action. Reports were completed on 416 cases during the year. In addition, the Forest Service reports on applications to lease minerals covered by the Mineral Leasing Act of February 25, 1920, on national forest lands reserved from the public domain. One region reported on more than 1,450 cases during the fiscal year 1950, a substantial increase over the previous year. During fiscal year 1950 it is estimated that the case load for the four western regions (2, 3, 4, and 5) concerned was in the neighborhood of 3,000. This activity has mushroomed in the last 3 years. The revenues from mineral leases on "public domain" national forests are deposited by the Department of Interior and are not credited as national forest receipts.

Land Exchange. Congress has passed 90 laws authorizing the exchange of national forest land and timber for private lands intermingled with or adjacent to national forests. During the fiscal year 1950, 179 exchanges were approved in which the United States will receive 137,139 acres, valued at $2,276,596, and will grant in exchange 20,767 acres of national forest land valued at $697,817 and stumpage valued at $1,132,246.

Mapping. The last remaining 15-minute quadrangle of a topographic mapping job in Arizona was completed through office editing, drafting, and reproduction. Checking and field editing were completed on a State of Washington area of 1,185 square miles. The office editing and drafting were also completed on this project during the fiscal year. Field work has been virtually completed on an area of 1,370 square miles in California. Another area of 1,829 square miles in California was processed through office control and plotting. Fifty percent of field editing and checking was reported on this project.

Field work including control was reported on about 500 square miles on a 3,660-square-mile area in Idaho. Field control was completed on an approved mapping area of 1,225 square miles in Arizona and control work for planning is in progress on an additional 3,809 square miles.

Elements of planning were submitted to the field on 3,875 square miles in Michigan, and 1,800 square miles in Alaska.

In the coming year, it is planned to carry the 1,829-square-mile area in California through the preparation of manuscripts, the 1,370-square-mile area in California through field edit, and to prepare planning sheets for 3,648 square miles on a new California area. Five hundred square miles of the 1,225-square-mile area in Arizona will be completed through manuscripts, and the remaining 725 square miles will be field checked and edited. Field control will be secured on 900 square miles in Arizona and 500 square miles of the California planning sheet area. Planning sheets will be prepared for 900 square miles in Colorado and an additional 6,024 square miles in Arizona and New Mexico.

Field control will be secured on 500 square miles of this latter planning sheet area in Arizona.

Watershed Management. Increased attention is being given toward development, adoption, and correlation of improved management standards and techniques in the daily jobs of resource management activities to insure better protection of watershed values and more efficient utilization of the water. Special jobs, which emphasize the local importance of national forest watersheds and water resources, include current reports being prepared to evaluate the present and future needs for water for all consumptive uses within the national forests of California; individual reports on 12 selected river basins in response to requests from the President's Water Resources Policy Commission; field reviews of "sore spots" on municipal watersheds and flood source areas regarding water supplies, erosion, pollution, and potential flood damages.

2. Resource Development:

Reforestation. During fiscal year 1950, 45,428 acres of denuded land were planted or seeded on the national forests. As during the previous year, planting was concentrated largely in the Lake States, the South, and the Pacific Northwest. The two nurseries in California and Oregon met with production problems that were solved during the year. Progress was made in meeting the constantly recurring job of eliminating brush and weeds that compete with planted trees. 15,459 acres of plantation were treated. These were located largely in the Lake States and South.

Revegetation. The program continued to emphasize doing the work on areas most in need of reseeding and where the money spent would bring greatest returns in the way of increased grazing capacity. Therefore, as in the past, major accomplishments were in the Intermountain Region, mostly in Utah and Nevada. Crested wheatgrass sown on depleted sagebrush types after ground preparation with heavy plow equipment continued to be the leading method. Estimated area reseeded in 1950 amounts to 63,000 acres, producing an estimated total of about 35,000 additional cow-months of grazing capacity. The total area reseeded to date is about 334,000 acres.

Fighting Forest Fires

This appropriation covers emergency fire control expenditures on the national forests. Administrative restrictions placed upon the use of these funds by the Forest Service require that expenditures shall not be made therefrom until forest fires have actually started. An exception is made to this rule, however, when fire conditions become so critical that the regular protective organization, which is financed from the appropriation "national forest protection and management," is unable to cope with the situation and when, therefore, the temporary employment of additional guards will clearly reduce expenditures for fire fighting.

Prior to the fiscal year 1951 Congress appropriated the nominal sum of $100,000 at the beginning of each fiscal year. Later in the year supplemental estimates were submitted which included actual obligations for the first half of the fiscal year and estimated obligations for the period January 1 to June 30. For the fiscal year 1951 Congress appropriated a total of $6,000,000, of which $2,500,000 was placed in a reserve which could be released only by approval of the Secretary and the Budget Bureau.

As of December 31, it had been necessary to obtain the release of $2,200,000 of the reserve.

FOREST RESEARCH

Forest and Range Management Investigations

Current Activities: All Federal research on forest and range lands, which make up 54 percent of the Nation's land surface is carried on under this appropriation. The object of the research is to develop improved techniques which will help to sustain and increase production of the renewable resources, timber, range and water, from these lands. The results of the research are used as a basis for the protection and management of the national forests and other Federal lands, and they are made equally available to States and private land owners throughout the Nation.

Functionally, research under this appropriation is broken down into that concerned with the growing and harvesting of timber products, the protection of forests from fire, the production and efficient use of range forage, and the management of both forest and range vegetation to produce the greatest amount of useable water and a minimum of erosion.

Organizationally, the work is carried on at 11 regional experiment stations in the continental U. S., at 1 in Puerto Rico, and at a research center in Alaska. These stations serve the major forest and range regions into which the United States is divided. Much of the research is concentrated on experimental forests and ranges representative of major problems. Supervision of studies on these areas and conduct of others is assigned to the Director of the regional station and his headquarters technical staff. These experimental areas of several hundred to several thousand acres each are either Federally owned or under the control of the Forest Service through leases or written agreements. On them are performed the experiments basic to proper management and protection of forest and range lands, and the practicability of the methods discovered are tested.

Cooperative interest on the part of State and private agencies, individuals and industries has resulted in very material aid to the Federal program. In the field of forest, range and watershed management, cooperators have provided services and cash for the fiscal year 1950 amounting to approximately $800,000. In addition, the capital value of lands, timber, and other facilities made available for research was increased. The total capital value of such contributions now stands at 3.5 million dollars. Emphasis on programs is being shifted to meet defense needs.

Research in forest management is emphasizing determination of methods for quickly increasing the growth rate of forests and hence the permissible annual cut. Also emphasized are cost and return studies to determine the tree sizes, stand volumes and equipment that will provide for most efficient use of manpower and equipment without damage to productive capacity of the forest resource. Comparisons of the more promising combinations of important factors are tested on a practicable

operating scale. Also being stressed separately and in combination with the above are cultural measures leading to control, by means of chemicals prescribed burning, and otherwise, of undesirable vegetation competing with crop trees. Methods of reforesting abandoned farm lands, stripped mining lands, and burned-over forests, are being improved through research. The development of hybrid trees for faster and more certain timber production is being studied, as well as improved methods for stimulating gum flow in pines for the production of rosin and its derivatives.

Range research is aimed at obtaining greater values from the range resource by increasing forage on land now producing below its potential, by grazing in a manner that will sustain this production, and by producing more meat, hides and wool at a lower cost. To realize this aim, grazing management practices have been and are being developed and tested which will maintain those ranges in satisfactory condition and will improve those deteriorated ranges not now producing their maximum in livestock products. On some badly deteriorated ranges where natural recovery under good management would be extremely slow, range reseeding research has laid the foundation for successful improvement programs. Continued research on what, how, when, and where to seed, and how to graze these reseeded stands will bring similar success to other ranges. The control of noxious and poisonous plants especially undesirable shrubs on range lands is being studied to find how they can be substantially reduced and replaced with valuable forage plants.

Investigative work in the protection of forest, range, and watershed lands from fire is directed toward reducing losses from fire and toward better efficiency in application of fire control measures. Successful management of these lands for their most productive use can be accomplished only is uncontrolled fire is excluded. The fire problem with which this activity is concerned is important to civil and military authorities as well as to land managers because of the serious threat to other values and activities by the 200,000 forest and range fires that occur every year. The use of wetting agents and chemicals to improve the efficiency of forest fire fighting is being given field trials this year; the investigation of unexpected behavior of big fires is getting special attention, improved action through use of airplanes and helicopters is being studied, and some exploration will be continued on possibilities of reducing the severity of fire-setting lightning storms through modern techniques of cloud seeding.

Watershed management research is directed towards improving soil and cover conditions and practices to alleviate flood and sediment problems arising out of past land use, and towards helping meet urban, rural, and industrial demands for water of good supply and high quality. Watershed use problems are attacked by obtaining quantitative measurements of the effects of such activities as fire, logging, hill-farming, grazing and road construction on water supply and quality. Concurrent with these studies are those to determine how to use watersheds for various economic purposes and still provide satisfactory supplies. Possibilities of increasing water yield through forest cutting are being studied. Particular attention is

being given to the effects of watershed use and management as they are reflected in soil water relations. This provides both an understanding of the results of given effects and a means of predicting the magnitude of such effects on other areas.

Selected Examples of Recent Progress: The Southeastern Station found that prompt regeneration of harvested loblolly pine stands can be obtained by careful selection of superior seed trees and thinning around such trees two years in advance of harvest. Such thinning increases seed production of selected trees up to seven times average production.

Growth rates of ponderosa pine can be doubled if stands are cut lightly every 10 to 20 years rather than cut heavily every 40 to 60 years as was formerly done. This change from long to short cutting cycles made possible an increase of 10 million board feet in the annual cutting budget of the Coconino National Forest in Arizona. An additional revenue of about $50,000 a year for stumpage is thus provided to the United States Government; and there will be an additional yearly gross return of about $550,000 to the lumber mills in the community dependent on the forest.

Budworm-resistant cuttings in spruce-fir forests of the Northeast have proved to be good business. Experimental cuttings removing the large, over-mature trees most attractive to the budworm have been found to cost less per cord of pulpwood produced than the traditional clear cutting which removes small and large trees alike. This is so because it takes twice as long to cut a cord of pulpwood from 5" trees as it does from 8" trees, and three times as long as from 15" trees.

New methods of turpentining Southern pine increase yield of first-class lumber. In a pilot plant test on an experimental forest in Florida, a quarter-million board feet of turpentined timber have been cut with a loss of less than one percent in lumber recovery due to the new bark chipping and acid treatment method of turpentining. Older turpentining methods made the lower part of the tree practically useless for wood products.

One of the results of forest research in naval stores will save gum producers half a million dollars in 1950. Sulphuric acid sprayed on fresh wounds to prolong the flow of gum is being used this year on 9 million naval stores trees. The acid method permits wounding the trees half as often and requires only 55 percent as much labor as older turpentining methods.

Light partial cuttings increase production and perpetuate stands of northern hardwoods. Studies at the Upper Peninsular Experimental Forest in Michigan showed that although a lesser quantity of tree reproduction follows partial cutting, a higher percentage of this reproduction is of good quality than in the reproduction following clear cuttings. These findings indicate that partial cuttings which are known to increase the rate of growth of the residual stand, will

also result in a perpetuation of this valuable forest type.

At its present rate of growth, 425 acres in a northern hardwood forest in Upper Michigan can support one woods worker year-round continuously. Experimental work indicates that good forest management can increase the annual yield of the forest so that one woods worker can be supported year-round on only 385 acres. For every ten men supported as a woods worker, employment will be furnished for 14 men in the sawmills or other conversion plants which use the forest products.

Undesirable hardwood brush can be killed by the application of chemicals to the bark of uncut stems. The efficiency of this method compared to applying chemicals to freshly cut stumps is among the studies being made on the Santee Experimental Forest. Solutions as low as one percent of 2,4,5-T, or of combinations of 2,4,5-T and 2,4-D in an oil carrier were found to be effective in completely killing hardwood brush and thus eliminating sprouting.

The advantage of using locally selected seed when growing loblolly pine has been shown by a study at Bogalusa, Louisiana. Plantations established in 1927 produced in 22 years: 42 cords per acre from local seed; 23 cords from Texas seed; 18 cords from Georgia seed; and 15 from Arkansas seed.

Longleaf pine can be successfully planted with tree-planting machines according to tests recently run at the Southern Station. Longleaf is the most difficult of the southern pines to plant and although survival of trees planted by machinery is slightly less than the standard hand-planting methods, the closer spacing of the machine-planted trees results in a better per acre stand.

Moderately stocked ranges in the Northern Great Plains produce heavier calves. At weaning time, calves from moderately grazed range weighed on an average of 33 pounds more than calves from the heavily stocked range. Difference in weight between the calves in these two treatments was still apparent when they were 18 months old, even though all calves had been treated alike for a year after weaning. These and other results of cooperative research with the Bureau of Animal Industry and Montana Agricultural Experiment Station are reported in Bulletin 463 of the Montana Agricultural Experiment Station.

Intermediate wheatgrass is a superior species for range reseeding in the ponderosa pine type of the Southwest. Comparison of forage yields of several of the best species reseeded in openings in the pine forest in northern Arizona shows that an intermediate-tall wheatgrass mixture, in which the former predominated, was most productive. This mixture yielded 2,140 pounds of air dry herbage per acre on a moist site and 1,220 pounds on a dry site. Smooth brome produced well on the moist site while crested

wheatgrass was the second in yield on the dry site. Native vegetation yielded one-fifth as much as the 2-year-old stand of the highly palatable intermediate wheatgrass mixture.

2,4-D foliage sprays have proved successful in reducing stands of big sagebrush. In California the butyl ester of 2,4-D resulted in a complete kill when applied on June 30. However, time of application is important, since the same treatment applied one month later produced a 92 percent kill. The native grass yields increased from 285 pounds per acre to 642 pounds when 98 percent of the crown density of sagebrush was killed. In Utah the ester form of 2,4-D gave a 94 percent kill. This kill of sagebrush plus a 91 percent kill of rubber rabbitbrush increased grass production on the range which had been reseeded from 2,350 pounds per acre to 5,700 pounds. Increased density and vigor of the forage plants gives better soil protection while furnishing more feed for livestock.

Grazing in the switch cane type in eastern North Carolina forests is beneficial. Grazing increased seedling establishment of pond pine and the growth rate of such seedlings. Cattle utilized at least 50 percent of the herbage which otherwise would have created a greater fire hazard and would have been fuel for fire. Grazing also made the forest more accessible for control of fires.

The control of scrub oak and other low value hardwoods in the piney woods of central Louisiana approximately doubled the grass production. How to control such hardwoods economically with ammate was described in M5296, a publication of the U. S. Department of Agriculture. The yield of the grass was 1,531 pounds per acre on treated areas, compared to 804 pounds on areas where hardwoods were not controlled. Cattle grazed the treated areas more heavily and the growth of the grass was faster and furnished succulent and nutritious forage longer into the summer, thereby increasing the cattle weights.

Moderate grazing by cattle of range reseeded to crested wheatgrass gave better protection to the soil than either heavy or light grazing. In cooperative studies at Benmore, Utah, movement of the soil, both during heavy rain and by strong winds when the soil was dry, was noticeable on heavily grazed range and on closely grazed spots of range lightly grazed on the average. No such movement was observed on the moderately grazed range. Heavy grazing, which utilized 80 percent of the herbage, left an insufficient protective cover. Under light grazing, which utilized only 50 percent of the herbage, some tufts were little used and the plants produced numerous seed stalks. Cattle avoided these tufts and concentrated their grazing on the previously grazed bunches, overgrazing such areas and adversely affecting their protective value. Under moderate grazing, which took 65 percent of the herbage, more uniform utilization of all tufts resulted, and the stubble and litter proved to be an adequate protective cover for the soil.

Cattle and rodents are both important agents in the spread of undesirable mesquite brush on southwestern ranges. Large numbers of mesquite beans are eaten by cattle even where sufficient grass forage is present. Passage of the mesquite seeds through the digestive tract of cattle doubles the immediate viability of the seed which at pod casting time is 6 percent. Such increased viability encourages seedling establishment, especially in manure. Rodents, particularly the Merriam kangaroo rat, harvest and bury significant quantities of mesquite seed. Studies in Arizona showed that 161 to 416 seedlings per acre emerged in one month and were associated to a marked degree with the activities of this rat. Seed caches containing seedlings of two age classes as well as additional sound seeds further indicate that such caches will continue to result in emergence of seedlings for several years.

In converting dense brush areas to productive range in the foothills of California, successful reseeding is necessary. Good stands of both perennial and annual grasses and some legumes were obtained in the woodland-chaparral type by broadcast seeding or drilling in the fall following burning, on areas where dense brush previously prevailed. Similar suitable stands were obtained when other dense brush types were burned and seeded by drilling or broadcasting and disking to cover the seed. Where dense brush was burned and not reseeded, the soil was practically bare a year after the burn and had seriously eroded from winter and spring storms. The palatable grass and legume forage obtained through reseeding furnishes valuable grazing.

Experiments with wetting agents have shown that they have a definite place in increasing the efficiency of forest fire fighting. The advantage of adding wetting agents to water is especially great in forest areas remote from water sources where it may cost up to $1.00 a gallon at the hose nozzle. Estimates of potential savings to the public through the use of wetting agents in controlling forest fires run up as high as five million dollars annually.

In the Northeast, methods of measuring climatic and other factors that affect forest fire danger have been perfected as a means of predicting the number of fires to be expected. This prediction permits for the first time the measurement of the effectiveness of forest fire prevention measures, the difference between the number of fires expected and those actually occurring indicating the effectiveness of the prevention program.

Further progress was made during the year in studing the methods of using fire as a beneficial agent in the management of longleaf and loblolly pine lands. Fires can be used in the control of certain diseases, in the elimination of undesirable tree species, in the preparation of a seedbed for pine seeds, and in the reduction of an accumulation of dried vegetation which would cause much damage if burned accidentally. For such uses fire is necessarily a

dangerous tool and must not be used until exact effects are known and successful techniques for complete control are established.

A comprehensive analysis just completed of the behavior and control of 36,000 fires that occurred over a ten-year period in Montana and North Idaho shows that (1) Costs of control and losses suffered from fire decrease positively on logged over lands with every measure taken to reduce the amount and continuity of logging slash, (2) Fire spreads faster in dry grass than in any other natural fuel, so presence of dry grass must be taken into special account in all fire plans, (3) Attack on fires by parachute fire fighters in roadless country is more successful than by ground methods, even though it is not much faster on the average, because men are fresher and better trained and the number needed can be more easily increased when aerial delivery is used, (4) Detection of fires from airplanes results in seeing a smaller portion during the first hour but over longer periods fewer are missed than by older methods, (5) Lightning fires concentrate at certain zones of elevation contrary to usual opinion.

Unregulated logging causes serious displacement of soil from mountain slopes. Soil movement from one short logging road on the Coweeta Experimental Forest over a 4-year period amounted to 6,850 cubic yards. Merely as fill material worth $1 per cubic yard, and without considering the losses in soil fertility or damages to water supply, this soil loss exceeds by about 5 times the $1,466 value of the forest products hauled over the road.

Conversion of central California bushfields to grass by burning and seeding can result in heavy sediment damage. Studies show that the greatest damage occurs on steeper slopes of poor soil, whereas on gentler slopes and more fertile soils reseeded burns produce the least soil losses and the best forage.

Overgrazing of pinyon-juniper and sagebrush lands in the Colorado River watershed results in serious runoff and sediment damages. On moderately grazed areas, water absorption was found to be 1.7 inches per hour and erosion rates only 0.3 tons per acre per inch of runoff, as against 0.6 inches per hour water intake and 9 tons of soil loss per acre per inch of runoff on the heavily grazed, thinly grassed areas.

The value of the Colman soil moisture meter has been greatly increased by the successful development of a method for calibrating the fiberglass soil units in cores of undisturbed soil in the field. The moisture-electrical resistance relations so obtained were found to correspond closely with laboratory determinations.

Cattle grazing is highly detrimental to hardwood forests. Additional evidence on the watershed damaging effects of cattle grazing in hardwood forests was provided by studies in North Carolina. After

8 seasons of grazing the soil was so compacted that its infiltration capacity was reduced 96 percent and the accumulation of flood producing storm water on the surface increased 625 times.

Root depth is highly significant in determining the possibilities of increasing streamflow by cutting vegetation. Experiments in the Wasatch Mountains of Utah demostrated that removal of deep-rooted aspen trees increased water availability by 4 inches without any erosion resulting. Baring the soil by the removal of shallow-rooted herbaceous growth beneath the aspen reduced water losses 4 inches more but at a loss of 10 tons of soil per acre, foreboding a serious flood and debris hazard to downstream communities.

Forest Products

Current Activities: The forest products research program is now aimed at providing to the extent possible, the research results and technical services required by the defense agencies, industries and others for the production, procurement, use, protection, modification, and conversion of forest products during the emergency. The re-examination of the program to assure maximum contribution to the defense effort was begun soon after the present emergency began and is now largely completed, as indicated by the following selected examples of work now under way.

1. Cellulose nitration: Emphasis is being placed by the production of cellulose for nitration, especially from hardwoods, and on the nitration of such pulps for explosives.

2. Protection of structures from fire: Studies in this field are being concentrated on improving the fire resistance of houses and other structures made of wood and wood-base materials.

3. Design manual for laminated timbers: The completion of a laminated timber design manual now in preparation for the use of engineers and designers of hangars and other military installations, wood boats and other products is being hastened.

4. More woods for veneer and plywood: While considerable progress has already been made in getting a number of little-used species into commercial use for veneer and plywood, increased emphasis is being placed on getting more of them used in view of the present shortage of preferred species and the increased demand for veneer and plywood which is developing.

5. Essential products from wood sugar: The work of improving methods for producing wood sugars from waste wood and converting them into essential products such as industrial alcohol, ethylene glycol, glycerine and livestock feeds has been intensified.

6. Dry kiln operator's manual: As wood shortages develop and users cannot wait for normal air drying, kiln drying becomes of increasing importance. Work already under way on a handbook that will be of use to the men who operate dry kilns has been accelerated.

7. Development of basic design data and procedures for pallets: Studies are under way to put the design of shipping pallets on a sound engineering basis. Empirical pallet design for the armed forces during the last war effected large savings of material, displacement and labor. With pallets increasing in popularity, the demand for basic design information for wide application from the standpoint of better shipping and the effective use of low grades of lumber in pallets increases.

8. Improvement of softwood and hardwood log grades: This activity has been intensified because log grades increase the practicability of allocating logs to their highest use, according to current needs.

9. Selection of wood for critical uses: Selection of wood for highly critical uses will bring new requests for improved selection methods. Studies are being undertaken to develop or improve non-destructive testing procedures to determine various strength properties of wood and to disclose hidden defects.

Selected Examples of Recent Progress:

1. A new high yield, less costly, and simpler chemical pulping process for hardwoods discovered: Up to 95 percent of the wood is transformed into pulp as compared to 50 to 75 percent with older chemical processes. It should increase the use of the abundant but little-used hardwoods and reduce the drain on the declining stocks of the favored softwood pulp species.

2. Lower cost and lighter weight freight cars possible by all wood and plywood construction: A large car manufacturer has used the design criteria for wood and plywood developed at the Forest Products Laboratory to construct freight cars that are truly all wood, the only metal parts used, other than the trucks, being the couplings, truck contact plates, and door frames. The cars have passed the service tests so far conducted.

3. Lumber can be dried much faster, cheaper, and with less degrade by newly developed accelerated kiln drying schedules: Existing dry kilns with adequate air circulation and good temperature and humidity control can be operated to take advantage of the faster schedules. It has been shown, for example, that 1-1/4 inch northern red oak can be dried in 28 days as compared to 45 days by standard schedules and with less checking.

4. New saw developed that uses less power, cuts smoother, and reduces waste: Based on the duo-kerf principle, this saw reduces power consumption by 20 to 25 percent, produces a smoother surface and hence less planing loss, and because the saw is thinner reduces the waste in sawdust.

5. Cushioning materials analyzed for packaging: Some 40 materials have been accurately classified as to shock-absorbing power, so that the thickness of cushioning needed to prevent damage in shipment can be specified for machines, instruments and other products. This represents a further step toward more precisely engineered packaging.

6. A new manual prepared on small sawmill operation aimed at making them more efficient: The manual will help operators do a better milling job, so that full economic use will be made of available timber and losses due to miscut logs and lumber will be reduced.

7. More woods shown to be suitable for rotary cut veneer and plywood: More than 20 species, which had been little used previously for veneer and plywood, were studied and a number of them are now being used commercially. The drain on the presently preferred species, which are in short supply, for veneer will be reduced by the use of more species.

8. Small operators being apprised of developments of power equipment suitable for all steps in logging to improve their operations: Leaflets describing improved logging equipment were prepared and disseminated. These developments permit closer utilization of logging waste and inferior species than heretofore.

9. Waste and costs reduced by use of softwood cut-stock: By gathering information on the possible use of small-size wood, called cut-stock, the Laboratory assists sawmills to salvage short-length material and wood-using factories to make use of it at savings.

Forest Resources Investigations

The objective of these investigations is to determine the amount and kind of forest land and timber resources in the United States, and possible solutions to economic problems of ownership, production, marketing, etc., associated with management and use of the nation's timber resources.

Current Activities: The nation-wide survey of forest resources is designed to determine the area, location and condition of forest lands, the volume and quality of remaining stands of timber, the annual growth of new timber crops, annual depletion of timber by cutting and destructive agencies, and potential requirements for various timber products from United States forests. The Survey program is being modified as needed to furnish information for defense planning, including possible means of stimulating war-time production of lumber and other forest products. Plans have been made to intensify the timber drain and requirements phases of the Survey and to conduct special inventories of timber species in critical supply.

Facts on timber resources obtained by the Forest Survey are widely distributed in the form of printed reports and type maps, special compilations of statistical data, and in answer to thousands of special requests from pulp and lumber companies, timber land owners, farmers, railroads, state and federal officials, and various others. Survey findings on timber resources and requirements for forest products are not only of great value to private industry and the public, but are also essential information for guiding national and state policies in forestry affairs.

As of July 1, 1950, 419 million acres, or about two-thirds of the forest land in the continental U.S. had been covered since initiation of the Forest Survey in 1930. Yet to be initially surveyed were 205 million acres, mostly in the Northeast, Central, and Rocky Mountain regions. Of the 302 million acres of forest land surveyed in the 1930's, and needing resurveys to determine important changes in area and volume that have occurred as a result of growth and depletion, 101 million acres had been covered. Reports have been completed for about three-fourths of the area surveyed.

Current Rate of Progress:

Forest Surveys during fiscal year 1951 are expected to inventory for the first time 17 million acres of forest land in eight states—California, Idaho, Maryland, New York, Pennsylvania, Delaware, New Jersey, and Ohio. Resurveys are expected to cover 23 million acres of forest land in seven States—Alabama, Georgia, Idaho, Michigan, Minnesota, Washington, and Wisconsin. State analytical reports covering the forest resources of Illinois, Florida, Montana, and Mississippi have been prepared for publication. In addition numerous statistical reports for States and counties are being issued regularly. A comprehensive report of Wood Used in Manufacture in 1948 is scheduled for publication in the near future.

In a number of states progress is being substantially aided by cooperation from various state agencies—notably in California, New York, Georgia, Minnesota, Wisconsin, and Maryland. By providing financial and other assistance the states are thus able to obtain more detailed resource statistics and maps than could be provided by federal funds alone.

Investigations of forest economic problems included completion of field work on studies designed to provide guides to profitable forest management in the South, and publication of results of earlier studies. Analysis of pulpwood supplies in relation to maintenance and expansion of pulp manufacture were continued in the Lake States and Northern Rocky Mountain Regions. A report containing an appraisal of a forest products cooperative enterprise in New York State was published. Analyses of markets, buyers, and specifications for timber products were made in three regions. Many special reports were made for government and inter-government agencies analyzing domestic and international forest situations, particularly as related to national defense. Assistance was given several States in problems of forest taxation and studies of the effect of State severance and yield tax laws on forest practices were initiated.

(b) Forest Development Roads and Trails

Appropriation Act, 1951 (Adjusted - see proposed structure, page)	$10,442,900
Activities transferred in 1952 Estimates to "Operating expenses, General Services Administration, Public Buildings Service" for operation and maintenance of buildings	-5,400
Base for 1952	10,437,500
Budget Estimate, 1952	17,500,000
Increase	+7,062,500

Note: Although an increase of $7,062,500 in direct appropriation is requested for this item for 1952, it is estimated that there will be an increase of only $5,915,862 in total funds available due to the availability of prior year balance of $1,146,638 in fiscal year 1951.

SUMMARY OF INCREASES AND DECREASES, 1952
(On the basis of available funds)

For the construction of access roads to standing timber	+5,950,462
Decrease due to providing a direct appropriation to the General Services Administration for certain procurement and leasing costs previously paid from this appropriation	-34,600

PROJECT STATEMENT

Project	1950	1951 (estimated)	Increase or decrease: GSA Adjustment	Increase or decrease: Other	1952 (estimated)
1. Construction	$2,429,023	$3,214,138	-$34,600	+$5,950,462 (1)	$9,130,000
2. Maintenance	7,471,251	8,370,000	- -	- -	8,370,000
Subtotal	9,900,274	11,584,138	-34,600	+5,950,462	17,500,000
Prior year balance available	-607,312	- -			
Transferred "Control of Forest Pests, Department of Agriculture"	+250,000	-250,000			
1950 balance available in 1951	+896,638	-896,638			
Transfer in 1952 estimates from "Salaries and Expenses, Forest Service	-97,000	-94,900			
Transfer in 1952 estimates to "Operating expenses, General Services Administration"	+5,400	+5,400			
Total appropriation or estimate	10,348,000	10,348,000			

INCREASE

(1) Increase of $5,950,462 for the construction of access roads to standing timber.

Need for Increase: Heavy demand for national forest timber has resulted in increasing rates of cut and new sales since early in 1950. This trend has accelerated since the Korean emergency. Lumber is on the list of critical materials essential for national defense. The demand for lumber now exceeds production. Future demand for national forest timber will become even greater due to depletion of privately owned stands. Every possible action should be taken to insure a high sustained rate of timber production.

During and since World War II there has been continued necessity for additional road construction to reach national forest timber. The cut has been increased from 1,740,271,000 board feet in 1940 to about 4 billion board feet a year now. This is only two-thirds of the annual growth. A clearly foreseeable shortage of lumber, pulp, and other forest products will result from increasing mobilization. The cut from national forests can be increased to about 6 billion board feet a year by the construction and improvement of about 4,555 miles of road at an estimated cost of approximately $100,000,000. These are the permanent main line roads that must be financed by the Government.

For example, the Lewis River Working Circle on the Gifford Pinchot National Forest is an area of about 450 square miles only about 60 miles from Portland, Oregon. Here the construction of 40 miles of main line road at an estimated cost of $1,786,000 would permit an increase in cut from the present rate of 20 million board feet to 70 million board feet annually. Seventy percent of the timber is Douglas-Fir. The additional 50 million board feet would sell, on the stump, for around $1,000,000 a year. It would take less than two years cutting under good forest management at the full sustained yield rate for the increased revenue to recover the cost of the roads.

Timber sale operators construct the branch roads extending out from these main arteries. The mileage of roads the purchasers will build to harvest the timber will be much greater than the mileage constructed by the Government.

The main line roads which the Government builds to facilitate harvesting timber are self-liquidating, since timber sale operators will bid higher prices for timber accessible to such roads than if they are required to construct such roads themselves. The Forest Service has sold some timber under terms which required the operator to build main line access roads. However, this method of providing the access roads to inaccessible timber bodies has definite disadvantages because:

1. Competition is limited. Small operators cannot compete in sales of this kind. Main line road construction is so expensive that large bodies of timber must be offered for sale to permit amortization of road construction costs. Competition is, therefore, restricted to the comparatively small number of companies who are financially able

to undertake expensive road building operations and to commit themselves to harvest large volumes of timber. A number of instances have already occurred where almost the entire cost of an access road has been recaptured through competitive bids above the advertised price. Such competition would have been highly improbable if it had been necessary to offer the same amount of timber in one large single block with a requirement that the purchaser build the main stem road.

2. Forest management hampered. Dependence on operator construction of main roads prevents best timber management. Good forest management may call for removal of overmature timber farther back in drainage first. It also calls for removal of insect damaged timber or minor products through small sales in advance of major cutting operations.

3. Slower rate of cutting. While timber sales requiring road construction are large they ordinarily cover only a small part of a drainage. Cutting is, therefore, limited to the area served by the main haul road in this portion of the drainage. A complete road system would permit cutting operations throughout the drainage. It would also permit shifting winter operations to low country and summer operations to high country, thereby stabilizing output and employment.

With an adequate road system on the national forests the annual cut of timber could be increased by 2 billion board feet, which at present prices would bring in an additional $20,000,000 yearly to the Treasury. This increase in cut would not have to await the completion of the entire system, but would accrue currently in proportion to the progress made in the road construction program.

Plan of Work: The increase requested would permit the construction of approximately 300 miles of timber access roads in those areas of national forests where the needs are most urgent and which will permit the greatest increase in timber cut.

CHANGES IN LANGUAGE

The estimates include proposed changes in the language of this item as follows (new language underscored, deleted matter enclosed in brackets):

> For expenses necessary for carrying out the provisions of section 23 of the Federal Highway Act approved November 9, 1921, as amended (23 U.S.C. 23, 23a), relating to forest development roads and trails, including the construction, reconstruction, and maintenance of roads and trails on experimental areas under Forest Service administration, [$10,348,000] $17,500,000, which sum is authorized to be appropriated by the [Act] Acts of June 29, 1948 (Public Law 834), and September 7, 1950 (Public Law 769), to remain available until expended: * * * *

The proposed changes in language are for the purpose of including the citation to the Act of September 7, 1950 (Public Law 769) which authorized the appropriation of $17,500,000 for each of the fiscal years 1952 and 1953.

STATUS OF PROGRAM

Forest development roads and trails are authorized by Section 23 of the Federal Highway Act of 1921. This system is primarily important for the protection, administration and utilization of national forest resources. These roads are ordinarily built to serve the property rather than intercommunity or cross forest traffic, but do at the same time extensively supplement county secondary systems and provide access to a great many private holdings. Forest development roads are most often surfaced with dirt or gravel and are usually considerably below highway standards in other respects. The horse and foot trails are primarily for protection against fire, but are also extensively used by cattlemen, miners, sportsmen and other recreationists.

The appropriation for forest development roads and trails in the fiscal year 1951 was $10,348,000. Maintenance is under way at an estimated cost of about $8,370,000. Maintenance will be accomplished on about 87,500 miles of roads and 127,000 miles of trails. The work this year includes the replacement of about 300 old timber bridges at a cost of about $1,300,000. This activity will have to be continued for many years as the timber bridges built by the Civilian Conservation Corps are becoming unsafe for further use. Gravel surfacing must be replaced on at least 500 miles of road at a cost of about $600,000.

After financing the essential maintenance that must be done to preserve the investment in the roads and trails and to serve the traffic over them, there will remain approximately $2.0 million for construction. This will be used primarily for the construction and reconstruction of the most urgent timber access roads.

Current Progress

In the fiscal year 1950, $7,471,251 was used for maintenance of the existing transportation system as follows:

Roads existing	107,731 miles	
Maintained by cooperators.	17,993 miles	
Maintained by Forest Service	89,738 miles at $60.16..	$5,398,561
Trails all maintained by Forest Service	127,283 miles at $ 9.73..	1,237,858
Bridge replacement, 410 bridges, totaling	4,468 lin. ft. at $187.	834,832
		$7,471,251

In addition, $2,429,023 was obligated for construction as follows:

Road construction and reconstruction of an average of only 1-1/3 miles on each national forest	207 miles at $9,027..	$1,868,682
Trail construction and reconstruction. .	576 miles at .400..	230,474
Bridge construction.	36 bridges at 9,163..	329,867
		$2,429,023

Status of Development Road and Trail System

	Per Cent	Miles	Miles Per Sq. Mile Gross Area	Estimated Cost to Complete
DEVELOPMENT ROADS				
Satisfactory Standard	34	49,522	0.14	-
Unsatisfactory Standard	41	58,209	0.16	$223,181,000
Non-Existing	25	36,076	0.10	396,767,000
Total	100	143,807	0.40	$619,948,000
TRAILS				
Satisfactory Standard	67	92,309	0.26	-
Unsatisfactory Standard	26	34,974	0.10	$ 6,728,000
Non-Existing	7	9,660	0.03	7,000,000
Total	100	136,943	0.40	$ 13,728,000
Total for Development Roads and Trails				$633,676,000

(c) Acquisition of Lands for National Forests, Weeks Act

Appropriation Act, 1951	$300,000
Reduction pursuant to Section 1214	-50,000
Base for 1952	250,000
Budget Estimate, 1952	100,000
Decrease (due to reduction in level of land purchase program)	-150,000

PROJECT STATEMENT

Project		1951 (estimated)	Decrease	1952 (estimated)
Acquisition of Lands for National Forests	$399,224	$250,000	-$150,000 (1)	$100,000
Unobligated balance	1,776	- -	- -	- -
Total available	401,000	250,000	-150,000	100,000
Reduction pursuant to Section 1214	- -	+50,000		
Total appropriation or estimate	401,000	300,000		

DECREASE

(1) The decrease of $150,000 will be met by reducing the acreage of land to be purchased. While the acquisition of land for national forests in the interests of watershed protection and timber production is important, this work is being deferred in the light of the current emergency conditions.

The estimate for 1952 will permit the acquisition of a limited amount of land which will become available within established purchase units and should be acquired to assure needed rehabilitation and proper forestry management in the interest of local residents and communities.

STATUS OF PROGRAM

This appropriation is provided to acquire lands for the protection of the watersheds of navigable streams and for the production of timber under the provisions of the Weeks law of March 1, 1911 (36 Stat. 961), as amended by the Acts of June 7, 1924 (43 Stat. 654) and March 3, 1925 (43 Stat. 1215).

There are now 78 national forest and purchase units, situated in 32 States and Puerto Rico, within which acquisition of lands under the above acts has been approved by the National Forest Reservation Commission and in which lands still remain to be acquired. All but a few of these units are east of the Great Plains.

Purchase work under the above acts was initiated in 1911 in the Appalachian regions and New England, and has since been extended further throughout the eastern United States. In all but five of the 39 fiscal years 1911 to 1950, congressional appropriations or allotments through executive action have been made available for land acquisition.

Within the aforesaid purchase units 22,845,262 acres have been acquired and 23,352,428 acres of land chiefly valuable for forestry and watershed purposes still remain to be acquired.

Basic purpose of this program is to conserve and build up the soil and timber resources and improve the watersheds. It is part of the overall program to provide adequate timber and water for the future. Forestry is essentially a long time enterprise and action to assure ample timber supplies must be taken well ahead of actual needs.

The unacquired lands in these purchase units are in large measure principally valuable for timber growing or for watershed protection. Many of them have been heavily logged, unwisely cultivated, or otherwise impaired. Most of them should be in public ownership to assure that they will be so managed as to contribute optimum benefits to streamflow regulation and timber production.

Dispersed public ownership leads to higher unit costs of protecting and managing the government lands, and decreases the effectiveness of good management practices on such lands since the intervening private areas remain subject to overcutting, unwise cultivation, over-grazing, or other detrimental practices.

There are usually available each year numerous "key" tracts of small size and an occasional large tract of special importance from a public standpoint. For example late in the fiscal year 1950 Middlebury College in Vermont offered for

sale 9500 acres located in the center of the Green Mountain National Forest. The tract contains 24 million feet of stumpage much of which is in need of cutting. Utilization of this stumpage is needed for national defense purposes and for stabilizing of local mills. The stumpage can be logged most efficiently in connection with adjacent national forest stumpage. Negotiations are underway to acquire about 25% of this tract (at $15 per acre) with fiscal year 1951 funds. Acquisition of the remainder when possible will facilitate and expedite cutting of the stumpage in an efficient and economical manner.

The following tabulation shows the status of the existing purchase units as of June 30, 1950 and progress expected in the fiscal year 1951.

	Gross Area (Acres)	Not to be Acquired (Acres)	Acquirable (Acres)
Purchase Units as of 6/30/50 . . . . . .(78)	53.210,999	7,013,309	46,197,690
Acquired by purchase, exchange, donation, transfer from other Federal agencies, and reservation from the Public Domain, as of 6/30/50			22,845,262
Balance to be acquired as of 6/30/50 to complete purchase units			23,352,428
Estimated acquisition by purchase during fiscal year 1951			30,000
Balance estimated to be acquired as of 6/30/51			23,322,428

It is estimated the fiscal year 1951 appropriation will permit acquisition of about 30,000 acres. Purchases will be in presently approved units of properties of special desirability.

(d) Acquisition of Lands for National Forests, Superior National Forest, Minnesota

Appropriation Act, 1951, and base for 1952	$150,000
Budget Estimate, 1952	150,000
Change	- -

PROJECT STATEMENT

Project	1950	1951 (estimated)	1952 (estimated)
Acquisition of lands for national forests, Superior National Forest, Minnesota	$66,576	$158,424	$150,000
1950 balance available in 1951 ...	+8,424	-8,424	- -
Total appropriation or estimate ..	75,000	150,000	150,000

STATUS OF PROGRAM

This appropriation provides for the purchase of lands within the Superior National Forest, Minnesota, pursuant to the special authorization of Congress contained in Public Law 733 approved June 22, 1948.

Public Law 733 was passed in response to public demand that steps be taken to preserve the wilderness conditions of a part of the Superior National Forest in Minnesota. It specifies an area in which federal ownership is to be consolidated. This area is located within a day's auto drive or a short airplane trip of a large portion of the Nation's population. Preservation of the area's unique wilderness values requires consolidated federal ownership. There are approximately 32,337 acres of privately owned land within the special area. Of this 1,565 acres of improved and 29,000 acres of unimproved land is to be acquired as promptly as practical.

The appropriation for fiscal year 1951 is $150,000 with which approximately 10,000 acres will be purchased. The acreage to be acquired in 1952 will depend in large part on the exact acreage of improved, as contrasted with the acreage of unimproved, land acquired with that year's appropriation.

(e) Acquisition of Lands from National Forest Receipts

Appropriation Act, 1951	$142,000
Budget Estimate, 1952	142,000
Change	- -

PROJECT STATEMENT

Project	1950	1951 (estimated)	1952 (estimated)
1. Uinta and Wasatch National Forests (Utah only)	$7,183	$40,000	$40,000
2. Cache National Forest (Utah only).	9,996	10,000	10,000
3. San Bernardino-Cleveland National Forests (Riverside County, California only)	16,192	22,000	22,000
4. Nevada-Toiyabe National Forests (Nevada)	8,684	10,000	10,000
5. Angeles National Forest (Calif.) .	15,366	20,000	20,000
6. Cleveland National Forest (San Diego County, California only)	4,730	5,000	5,000
7. Sequoia National Forest (Calif.) .	34,668	35,000	35,000
Unobligated balance	39,421	- -	- -
Total appropriation or estimate	136,240	142,000	142,000

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[illegible]	[illegible]	[illegible]	[illegible]

STATUS OF PROGRAM

This appropriation provides for the purchase of lands under the provisions of seven special acts of Congress enumerated in the appropriation item. These acts were passed with the support and concurrence of local people so that certain private lands intermingled with existing national forest lands could be acquired and placed under national forest administration. These lands are not in the drainages of navigable streams, and therefore, cannot be acquired under the Weeks law of March 1, 1911. They frequently are subject to forms of misuse such as clear cutting of timber, overgrazing, removal of brush cover, etc., which lead to soil and resource depletion, and which minimize or neutralize the protection and management practices carried out on surrounding national forest lands. In the southern California areas, occupancy and use of these interspersed private lands may also create fire hazards which threaten not only these tracts but also large areas of surrounding publicly owned and protected watershed. Protection and management of such lands as part of the national forest is recognized as highly desirable by local communities, especially from the standpoint of erosion prevention and flood control. The authorizing acts provide that certain proportions of the receipts of the specified national forests may be appropriated and used for the purchase of these lands. Since 25 percent of these receipts, otherwise, would be distributed to the counties, such provision, in effect means that the counties contribute one-fourth of the cost of the acquired lands.

The following table shows the status of the purchase program under this appropriation:

Purchases of Land under the Forest Receipts Acts

State and Purchase Unit	Acquired to 6/30/50 (Acres)	Estimated Balance to be acquired (Acres)	Appropriation available in F.Y. 1951	Estimated acreage to be purchased in 1951
UTAH				
Uinta-Wasatch..	83,523	79,566	$ 40,000.00	7,000
Cache.	16,131	109,880	10,000.00	2,000
NEVADA				
Nevada-Toiyabe.	8,569	100,851	10,000.00	2,000
CALIFORNIA				
Cleveland-San Bernardino(Riverside County)	10,730	71,270	17,837.88	4,500
Angeles	1,030	26,960	20,000.00	800
Cleveland (San Diego County) .	1,040	89,960	5,000.00	1,000
Sequoia	7,659	37,263	35,000.00	2,700
TOTALS. . . .	128,682	515,750	137,837.88	20,000

The tracts to be acquired will be within the designated units for which public ownership offers the best assurance of adequate protection of soil and vegetative growth, restoration where necessary, and long-time management, with emphasis on watershed and erosion protection.

(f) State and Private Forestry Cooperation

Appropriation Act, 1951 (Adjusted - see proposed structure, page 338)	$10,867,800
Reduction pursuant to Section 1214	-35,000
Base for 1952	10,832,800
Budget Estimate, 1952	10,820,000
Decrease (to provide a direct appropriation to the General Services Administration for certain procurement and leasing costs previously paid from this appropriation)	-12,800

PROJECT STATEMENT

Project	1950	1951 (estimated)	GSA adjustment	1952 (estimated)
1. Cooperation in forest fire control	$9,024,268	$9,504,900	-$11,400	$9,493,500
2. Cooperation in forest tree planting	226,045	442,061	- -	442,061
3. Cooperation in forest management and processing	634,106	628,796	-1,400	627,396
4. Cooperation in farm forestry extension	105,628	106,343	- -	106,343
5. General forestry assistance	151,400	150,700	- -	150,700
Unobligated balance	3,253	- -	- -	- -
Total available	10,144,700	10,832,800	-12,800	10,820,000
Transfer in 1952 estimates from: "Salaries and Expenses, Forest Service"	-44,700	-67,800		
Reduction pursuant to Section 1214	- -	+35,000		
Total appropriation or estimate	10,100,000	10,800,000		

CHANGES IN LANGUAGE

The estimates include proposed changes in the language of this item as follows (new language underscored):

STATE AND PRIVATE FORESTRY COOPERATION

For expenses necessary for cooperation with the various States in forest-fire prevention and suppression, in forest tree planting, in forest management and processing, and in farm forestry extension, pursuant to the Act of August 25, 1950 (Public Law 729), and sections 1, 2, 3, 4, and 5 of the Act of June 7, 1924 (16 U.S.C. 564-568a), and Acts supplementary thereto; advising timberland owners, associations, and other appropriate agencies in the application of forest management principles to federally owned lands leased to States and to private forest lands, and advising wood-using industries in processing of forest processing of forest products, so as

to attain sustained-yield management, the conservation of the timber resources, the productivity of forest lands, and the stabilization of employment and economic continuance of forest industries; $10,820,000.

This language proposes the consolidation of the two mainhead appropriation items "Forest fire cooperation" and "Farm and other private forestry cooperation" into a new mainhead appropriation "State and private forestry cooperation." This consolidation is proposed for the purpose of simplifying the appropriation structure and administration of the Forest Service, and will in no way affect the nature or scope of the work conducted, except as to activities authorized by the Act of August 25, 1950 (Public Law 729). This Act, entitled the Cooperative Forest Management Act, repeals the cooperative Farm Forestry (Norris-Doxey) Act effective June 30, 1951, and extends the cooperative management services heretofore authorized in the latter Act to all private forest landowners (instead of only farmers) and operators, and processors of primary forest products.

STATUS OF PROGRAM

Current Activities:

This program, for the most part carried on in cooperation with the States, encourages private timber growing through assistance in preventing and suppressing forest fires, reforestation of denuded areas, good management of woodlands, and farm forestry extension work.

The program centers on forest land in private ownership although to a minor degree it includes State-owned lands and Federal lands under long-term lease to the States. These privately owned lands comprise three-fourths of the Nation's commercial forest area. They are the most productive and accessible forest lands and from them comes 90 percent of all timber cut. The program further centers on small forest properties in private ownership because (1) 76 percent of the private commercial forest acreage is in small holdings averaging only about 62 acres each, (2) the small-owner group includes 99 percent of all private forest owners and (3) present cutting practices are poorest on these small properties and their owners do not have the technical knowledge or skills necessary to put their woodlands in productive condition.

Recent Progress and Trends:

(1) Cooperation in forest fire control - Assistance is furnished 43 States and 1 Territory in preventing and suppressing forest fires on private and State-owned lands. This assistance includes financial aid, training in fire fighting techniques, procurement and development of better fire tools, equipment, radio and communication facilities, and direction of a Nation-wide campaign to reduce the number of man-caused forest fires. The status of protection on these non-Federal areas on January 1, 1950 was:

(a)	State and private forests now being protected	357 million acres	
	State and private forests unprotected but needing it	70 "	"
	Total	427 "	"
(b)	Calendar Year 1949 -		
	Number of fires on protected lands -	78,649	- 43%
	Number of fires on unprotected lands (estimated) -	105,533	- 57%
	Total	184,182	-100%
(c)	Area burned on protected lands -	2,320,485 acres	- 15%
	Area burned on unprotected lands (estimated) -	12,760,118 "	- 85%
	Total	15,080,603 "	-100%

(d) Percent of protected area burned - .65
Percent of unprotected area burned (estimated) - 15.59

(e) F. Y. 1950 expenditures by:

State and counties	$18,121,195 -	62%
Private owners	2,261,440 -	8%
Federal (Clarke-McNary)	9,000,000 -	30%
Total	29,382,635 -	100%

(f) State prosecutions for fire law violations 6,880 with 95% convictions.

(2) Cooperation in forest tree planting - For more than 60 million acres of privately owned forest land--about one-sixth of the total private forest acreage--planting is the only practical way to restore productivity. To encourage woodland owners to plant trees, planting stock is provided at less than cost. The States grow the trees and the Federal participation consists of sharing part of the cost with the States.

For F. Y. 1950:

(a) There are 41 States and 2 Territories in the Program

(b) Trees distributed -

Under this program -	136,501,000
Not under this program -	169,927,000
Total	306,428,000

(c) Expenditures -

Federal -		$224,600
State -		
From appropriation -	$758,775)	
From sale of planting stock -	555,360)	1,314,135
Total		$1,538,735

(3) Cooperation in forest management and processing - In cooperation with State Foresters technical forestry service is provided private landowners. Work is done in specific project areas of two or more counties each. In each project a forester assists small woodland owners in technical timber management and marketing problems which they cannot do themselves.

For F. Y. 1950:

(a) Number of States in the program - 39

(b) Number of service foresters - 226

(c) Number of woodland owners assisted - 22,828

(d) Woodland area involved - 2,543,000 acres

(e) Number of forest products operators assisted - 5,773

(f) Expenditures:

State -	$726,973
Federal Appropriation -	634,106
Total	$1,361,079

Coöperation in Farm Forestry Extension (Extension Service)

(A) The educational work carried on during the past year resulted in increased activity in the following: forest tree planting for pulpwood, fence posts, saw timber, and other products; home use of farm grown timber as lumber for new construction and repair of farm buildings; marketing of farm timber; treatment of lumber and fence posts with preservatives; mechanization of farm logging operations and reduction of costs by use of better equipment and improved logging practices.

(B) For the past 25 years the Agricultural Extension Service in California has carried on a campaign of education emphasizing the value of windbreaks in citrus areas of Orange, San Bernardino, Riverside, and Los Angeles counties. Field studies show that adequate windbreaks are a vital part in the production of high quality fruit. Now, there are approximately two thousand miles of eucalyptus windbreaks in these areas which add millions of dollars each year to the value of the citrus crop. This is because well protected trees maintain better vigor and produce larger crops of better quality and value.

(C) In Wyoming the blizzard of 1949 brought forth many instances of suitable protection by trees from drifting snow and freezing winds. Trees provided protection for farm buildings and livestock. In Goshen County a shelterbelt consisting of 6 rows of trees was planted in 1936. The trees were spaced according to the extension forester's recommendations. Snow drifted in the trees to a depth of 16 to 20 feet and for a distance of 50 to 100 feet to the leeward side. Livestock had free access to feed lots and buildings inside the windbreak. These lots were not drifted in with more than 2 to 3 feet of snow. This windbreak during the winter of 1949 meant $3,000 to this farm home and livestock from the standpoint of protection, and saving of heating in the house.

(D) In Tillamook County, Oregon a coastal county of 500,000 acres, there are only 60,000 acres of farm land and the remainder is in spruce - hemlock timberlands. There has never been a market for pulpwood from these farm woodlands so farmers' interest has been very low. By working with a pulp company at Oregon City, a collection point has now been established in the county and pulpwood is being purchased f.o.b. the collection point. Approximately 15 farmers have already begun production and have begun making annual incomes from their woodlands. The production of this wood has become another integrated farm enterprise.

(5) General forestry assistance - As the major Federal agency dealing with forestry, the Forest Service gets thousands of inquiries and requests from the general public for information on forestry matters. Most of the inquiries from private consulting foresters, State Foresters, professional forestry schools, industrial foresters, and from other Federal departments are highly technical and ordinarily the information or technical assistance needed is not available anywhere else. Much of this requested assistance is given by field technicians of the Service and involves numerous field surveys, consultations, etc. Also included in this item is administration of nearly 500,000 acres of Federally owned forest land under long-term lease to the States.

State Allotments and Expenditures for Cooperation in Forest Fire Control

State	State and Private Funds Expended, F.Y. 1950	Federal Allotments, F.Y. 1951
Alabama	$ 573,959	$ 332,638
Arkansas	547,188	270,476
California	3,976,870	1,637,621
Colorado	42,655	27,647
Connecticut	79,021	49,025
Delaware	11,054	13,500
Florida	1,115,607	465,553
Georgia	1,026,214	331,027
Hawaii	7,138	4,500
Idaho	298,226	132,155
Illinois	39,367	25,000
Indiana	82,894	57,885
Iowa	12,022	25,000
Kentucky	125,519	100,308
Louisiana	648,558	258,740
Maine	649,367	188,364
Maryland	233,212	99,423
Massachusetts	273,044	90,931
Michigan	1,000,855	431,640
Minnesota	464,764	268,736
Mississippi	464,835	259,703
Missouri	433,335	192,413
Montana	138,681	76,625
Nevada	18,345	25,000
New Hampshire	113,867	69,429
New Jersey	264,279	105,717
New Mexico	130,355	25,000
New York	557,803	243,288
North Carolina	528,139	255,626
Ohio	142,722	57,088
Oklahoma	99,698	58,850
Oregon	1,540,306	708,166
Pennsylvania	484,202	199,790
Rhode Island	78,256	26,847
South Carolina	514,663	320,191
South Dakota	31,045	25,000
Tennessee	331,940	123,215
Texas	257,036	168,654
Utah	43,256	25,000
Vermont	64,789	25,000
Virginia	416,472	192,279
Washington	1,457,844	583,556
West Virginia	304,488	163,462
Wisconsin	738,745	284,932
Administration, Inspection, Prevention and Special Services to States	--	455,000
Reductions under provisions of Sec. 1214 of F.Y. 1951 Appropriation Act	--	20,000
Grand Totals	$20,382,635	$9,500,000

(g) Forest Fire Cooperation

The 1952 Budget estimates propose the consolidation of this item and the appropriation"Farm and Other Private Forestry Cooperation" into a new appropriation "State and Private Forestry Cooperation." Therefore, the work formerly reported under the heading "Forest Fire Cooperation" is now included under (f) "State and Private Forestry Cooperation". (See proposed structure, page 338).

CHANGE IN LANGUAGE

The estimates propose deletion of language for this item as follows:

> [For cooperation with the various States or other appropriate agencies in forest-fire prevention and suppression and the protection of timbered and cut-over lands in accordance with the provisions of sections 1, 2, and 3 of the Act approved June 7, 1924, as amended (16 U.S.C. 564-566), $9,500,000.]

This change in language is in accordance with the proposed transfer in the estimates of this item to the appropriation "State and Private Forestry Cooperation."

(h) Farm and Other Private Forestry Cooperation

The 1952 Budget estimates propose the consolidation of this item and the appropriation "Forest Fire Cooperation" into a new appropriation "State and Private Forestry Cooperation." Therefore, the work formerly reported under the heading "Farm and Other Private Forestry Cooperation" is now included under (f) "State and Private Forestry Cooperation." (See proposed structure, page 338).

CHANGE IN LANGUAGE

The estimates propose deletion of language for this item as follows:

> [To enable the Secretary through the Forest Service to advise timberland owners and associations, wood-using industries or other appropriate agencies in the application of forest management principles to federally owned lands leased to States and to private forest lands, so as to attain sustained-yield management, the conservation of the timber resources, the productivity of forest lands, and the stabilization of employment and economic continuance of forest industries, and to carry into effect, through such agencies of the Department as he may designate, the provisions of the Cooperative Farm Forestry Act, approved May 18, 1937 (16 U.S.C. 568b), (not to exceed $785,034) and the provisions of sections 4 (not to exceed $449,200) and 5 (not to exceed $65,766) of the Act approved June 7, 1924 (16 U.S.C. 567-568), and Acts supplementary thereto; $1,300,000.]

This change in language is in accordance with the proposed transfer in the estimates of this item to the appropriation "State and Private Forestry Cooperation."

(i) Cooperative Range Improvements

Appropriation Act, 1951	$700,000
Budget Estimate, 1952	750,000
Increase (for construction and maintenance of range improvements)	+50,000

PROJECT STATEMENT

Project	1950	1951 (estimated)	Increase	1952 (estimated)
Cooperative range improvements	- -	$700,000	+$50,000(1)	$750,000

INCREASE

(1) Increase of $50,000 for construction and maintenance of range improvements.

Section 12 of the Act of April 24, 1950, authorizes an appropriation of 2 cents per animal month for sheep and goats and 10 cents per animal month for other kinds of livestock under permit during the calendar year preceding the calendar year in which the Budget year begins. The 1952 estimate contemplates an appropriation in conformity with the provisions of this Act. Estimated animal months in calendar year 1950 are 8,860,000 for sheep and goats and 5,728,000 for other kinds of livestock. The 1952 appropriation of $750,000 will be derived from grazing receipts collected in the fiscal year 1951. These are estimated at $3,800,000.

The increase will be used for both construction and maintenance of physical range improvements. Most of it, however, will go into maintenance or reconstruction of range fences and stock watering places already installed. These improvements were originally erected to meet certain essentials in range management—forest boundary fences to keep permitted livestock on national forest land; division fences to obtain even distribution of the cattle to avoid damage to the forage from over-concentration in favored spots; and water developments scattered uniformly over the range to obtain more even distribution of use and in many places to make range available which otherwise would go unused because of lack of water.

Many fences, water developments and other projects constructed 15 years or more ago are in a bad state of repair and are not fulfilling the purpose for which built. Range cannot be properly managed without fences nor utilized without water.

CHANGES IN LANGUAGE

The estimates include proposed changes in the language of this item as follows (new language underscored, deleted matter enclosed in brackets):

COOPERATIVE RANGE IMPROVEMENTS

1 [Cooperative range improvements:] For artificial revegetation,
construction, and maintenance of range improvements, control of
rodents, and eradication of poisonous and noxious plants on
2 national [forest lands, pursuant to] forests, as authorized by
3 section 12 of the Act of April 24, 1950 (Public Law [Numbered]
4 478), [$700,000] to remain available until expended, an amount
for each national forest equivalent to 2 cents per animal-month
for sheep and goats and 10 cents per animal-month for other
kinds of livestock under permit on such national forest during
the calendar year 1950, but not in excess of, and to be derived
from, grazing fees received during the fiscal year 1951 from
such national forest.

The first three changes are for the purpose of simplifying and clarifying the wording of the item and will not affect, in any way, the character and scope of the work involved.

The fourth change deletes a specific amount to be appropriated and inserts in lieu thereof language which, consistent with the basic legislation (Public Law 478, approved April 24, 1950), makes the amount of the appropriation dependent upon the number and kind of livestock under grazing permits on the national forests during the calendar year 1950. Inasmuch as this appropriation is derived from grazing receipts, and the amount of the appropriation is determined by the application of a formula, it is believed that the recommended language would be preferable.

STATUS OF PROGRAM

Of the moneys received from grazing fees from each national forest there is made available at the end of each fiscal year, when appropriated by Congress, an amount equivalent to 2 cents per animal-month for sheep and goats and 10 cents per animal-month for other kinds of livestock under permit on such national forest during the calendar year in which the fiscal year begins. The fiscal year 1952 appropriation will be based on animal-months in calendar year 1950. The funds will be used mainly for the construction and maintenance of range improvements such as fences, stock watering facilities, bridges, corrals, driveways, etc., in order to protect or improve the future productivity of the range.

(j) Payments to School Funds, Arizona and New Mexico Act of June 20, 1910

Appropriation Act, 1951	$71,930
Budget Estimate, 1952	71,930
Change	- -

PROJECT STATEMENT

Project	1950	1951 (estimated)	1952 (estimated)
Payments to school funds, Arizona and New Mexico, Act of June 20, 1910 (appropriation or estimate)	$60,775	$71,930	$71,930

STATUS OF PROGRAM

The States of Arizona and New Mexico are reimbursed, as income for their common-school fund, in such proportion of the gross proceeds of all the national forests within those States as the area of land granted to the States for school purposes within the national forests bears to the total area of all national forests within the States. (Act of June 20, 1910, 36 Stat. 562,573.)

As soon after close of the fiscal year as the receipts from national forests and the area of school lands in the States of Arizona and New Mexico are determined, the payments are made to the States. Payments in fiscal year 1951 will be $71,335 to Arizona, and $595 to New Mexico.

(k) Payment to Minnesota (Cook, Lake, and Saint Louis Counties) from the National Forests Fund

Appropriation Act, 1951, and base for 1952	$45,000
Budget Estimate, 1952	45,000
Change	- -

PROJECT STATEMENT

Project	1950	1951 (estimated)	1952 (estimated)
Payment to Minnesota (Cook, Lake, Saint Louis Counties) from the National Forests Fund (Appropriation or estimate)	$43,548	$45,000	$45,000

STATUS OF PROGRAM

Section 5 of Public Law 733, 80th Congress, approved June 22, 1948, provides that the Secretary of the Treasury, upon certification of the Secretary of Agriculture, shall pay to the State of Minnesota at the close of each fiscal year an amount equivalent to three-fourths of one percent of the fair appraised value of certain National Forest lands in the counties of Cook, Lake, and St. Louis situated within the Superior National Forest. The Act further provides that payment to the State shall be distributed to each of these counties in conformity with the fair appraised value of such National Forest lands in each county.

(1) Payments to States and Territories from the National Forests Fund

Appropriation Act, 1951	$8,372,747
Budget Estimate, 1952	10,354,017
Increase (due to an estimated increase in the National forest receipts for the fiscal year 1951)	+1,981,270

PROJECT STATEMENT

Project	1950	1951 (estimated)	Increase	1952 (estimated)
Payments to States and Territories from National Forests Fund (appropriation or estimate)	$7,753,275	$8,372,747	+$1,981,270(1)	$10,354,017

INCREASE

(1) The increase of $1,981,270 in this item for payments to States and territories in fiscal year 1952 results from an estimated increase in national forests receipts for the fiscal year 1951.

STATUS OF PROGRAM

The Acts of May 23, 1908, and March 1, 1911, as amended by the Act of June 30, 1914, require, with a few exceptions, that 25 percent of all money received from the national forests during any fiscal year be paid to the States and territories in which the forests are located, for the benefit of public schools and public roads of the county or counties in which such national forests are situated. The amount of this appropriation varies each year in direct proportion to national forest receipts during the previous fiscal year.

The reductions made, or the amounts set aside, from gross receipts before the 25 percent is applied, are listed below:

1. Receipts from the Tongass National Forest, Alaska, are being held in a suspense account pending the settlement of Indian rights under the provisions of the Act of August 8, 1947, Public Law 385.

2. The receipts from certain lands in the Mt. Hood National Forest, Oregon, are paid to Confederated Tribes of the Warm Springs Reservation of Oregon, under the terms of the Act of July 3, 1948, Public Law 892.

3. The receipts from parts of three counties in the Superior National Forests under the terms of the Act of June 22, 1948, Public Law 733.

4. For lands in certain counties in Utah, Nevada, and California, the States receive 25 percent of receipts only after funds have been set aside for the acquisition of national forest lands within the specified national forests under the terms of special acts authorizing annual appropriations from forest receipts for this purpose.

5. The receipts from certain lands in Oregon are being held in a suspense account pending determination of the custody of these lands.

6. Payments to the States of Arizona and New Mexico under the provisions of the Act of June 20, 1910, of shares of the gross receipts from the national forests in those states which are proportionate to the areas of land granted to the States for school purposes within the national forests.

(m) Roads and Trails for States, National Forests Fund

Appropriation Act, 1951	$3,350,379
Budget Estimate, 1952	4,141,607
Increase (due to an estimated increase in the National forest receipts for the fiscal year 1951)	+791,228

PROJECT STATEMENT
(On an available funds basis)

Project	1950	1951 (estimated)	Increase	1952 (estimated)
1. Construction	$1,569,804	$3,050,379	+$791,228(1)	$3,841,607
2. Maintenance	706,700	300,000	- -	300,000
Subtotal	2,276,504	3,350,379	+791,228	4,141,607
Prior year balance available in 1950	-1,930,486	- -	- -	- -
1950 balance available in 1951	+2,755,402	-2,755,402	- -	- -
1951 balance available in 1952	- -	+2,755,402	- -	-2,755,402
1952 balance available in 1953	- -	- -	- -	+2,755,402
Total appropriation or estimate	3,101,420	3,350,379	+791,228	4,141,607

INCREASE

(1) The increase of $791,228 in this item for fiscal year 1952 results from an estimated increase in national forest receipts for the fiscal year 1951.

STATUS OF PROGRAM

Ten percent of moneys received from activities of the national forests during each fiscal year is available at the end thereof to the Secretary of Agriculture for the construction and maintenance of roads and trails within the national forests in the States from which such proceeds are derived. (Act of March 4, 1913, 16 U.S.C. 50) These funds are used only for the construction of roads and trails within the appropriate national forests.

STATEMENT OF OBLIGATIONS UNDER ALLOTMENTS,
WORKING FUNDS AND TRUST FUNDS

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Research and Marketing Act of 1946 (Title II), Department of Agriculture (Forest Service):			
Research on markets and prices for farm forest products	$39,551	$44,000	$44,000
Control of Forest Pests, Department of Agriculture (Forest Service):			
For white pine blister rust control on national forests	1,901,416	1,805,500	1,804,500
For insect control on national forests	1,600,405	2,360,458	a/ - -
Total, Control of Forest Pests ...	3,501,821	4,165,958	1,804,500
Flood Control, Department of Agriculture (Forest Service):			
Preliminary examinations and surveys, and works of improvement on headwaters of streams, including upstream engineering, soil stabilization, and reforestation on selected watersheds authorized by various Flood Control Acts	1,747,046	1,799,800	1,855,500
Administrative Expenses, Section 392, Agricultural Adjustment Act of 1938, Department of Agriculture (Forest Service):			
Cooperation with Production and Marketing Administration in administration of the naval stores conservation program	19,695	21,304	21,304
Local Administration, Section 388, Agricultural Adjustment Act of 1938, Department of Agriculture (Forest Service):			
Cooperation with Production and Marketing Administration in administration of the naval stores conservation program	105,051	108,425	108,425

a/ Allotments under this appropriation for 1952 have not been determined.

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Emergency Reconstruction and Repair, Forest Service:			
For reconstruction and replacement of roads, trails, bridges, telephone lines, and other facilities and improvements in the national forests damaged or destroyed by floods ...	2,057,190	- -	- -
Acquisition of Lands and Construction of Improvements, Coronado National Forest:			
For acquisition of lands and construction of improvements in the Coronado National Forest, Arizona as authorized in P.L. 229, approved August 15, 1949	- -	16,177	- -
Expenses and Refunds, Brush Disposal, Department of Agriculture:			
For removal of brush and other debris resulting from cutting operations (16 U.S.C. 490)	- -	88,944	1,400,000
Payments for Sale of Land and Timber:			
Refunds of payments for sale of land and timber	2,854	- -	- -
Working Funds, Agriculture (Forest Service)(General Account) Advanced from:			
National Military Establishment, Department of the Air Force:			
Research and consulting services on sandwich materials, aircraft cargo, floor panels, packaging and container problems, glues, plastics, core and bonding materials	142,678	171,899	- -
National Military Establishment, Department of the Army:			
Restoration of damaged national forest lands at Camp Livingston, and Camp Claiborne, Louisiana ..	50,968	- -	- -
Research on glues for plywood and other military items, packaging and container problems, prefabricated housing, soil trafficability and fire damage in forested areas: survey of forest products requirements for military purposes	80,366	530,581	- -
Total, Department of the Army .	131,334	530,581	- -

(Continued on next page)

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Working Funds, Agriculture (Forest Service) (General Account) Advanced from: (Continued)			
National Military Establishment, Department of the Navy:			
Research on plywood, glues, laminated plastics, sandwich construction, core and bonding materials, packaging and container materials	115,746	93,785	- -
National Advisory Committee on Aeronautics:			
Studies of effects of high and low temperatures on the properties of adhesives, and of the strength and bonding of cellular cores for sandwich construction	22,849	3,858	- -
Department of the Interior:			
Protection of Department of the Interior lands within national forests and for smoke jumper service on National Park Service lands	65,818	9,014	- -
Rehabilitation or relocation of national forest resources and improvements damaged or destroyed by activities of Department of the Interior agencies	7,297	19,597	- -
Total, Department of the Interior	73,115	28,611	- -
Department of Commerce, Public Roads, Administration:			
Investigation of applications, and construction, maintenance, and improvement of access roads to sources of raw materials	1,744	6,349	- -
Federal Power Commission:			
Investigation and supervision of Federal Power Commission projects.	2,052	1,444	- -
Housing and Home Finance Agency:			
Program of investigations and research on building materials and systems	22,292	152,732	- -

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Working Fund, Agriculture (Forest Service) (General Account) Advanced from: (Continued)			
National Security Resources Board:			
To cover cost of conducting a forest products materials survey	798	6,702	--
Production and Marketing Administration:			
Research on development of packages for dried and shell eggs	4,495	5	--
Rural Electrification Administration:			
For technical assistance on power-line pole problems	15,435	9,832	--
Soil Conservation Service:			
For a snow survey in Montana	5,000	--	--
For production of tree planting stock	4,886	314	--
Total, Soil Conservation Service.	9,886	314	--
Total, Working Funds, Agriculture, Forest Service, General Account	542,424	1,006,112	--
Working Funds, Agriculture, General (Forest Service) Advances from:			
National Military Establishment, Department of the Army:			
For training Japanese agricultural leaders in the field of agriculture	--	600	--
To cover the cost of providing data in connection with a comprehensive survey of the Arkansas-White-Red River basin	--	a/ 19,000	--
National Military Establishment, Department of the Navy:			
For mapping strategic areas	60,887	64,113	--
Department of State:			
For training six Koreans in forestry	186	258	--
Total, Working Fund, Agriculture, General	61,073	83,971	--

a/ Allotment as of December 31, 1950.

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Working Funds, Agriculture, Forest Service, Special Fund:			
Advanced from Interior Department:			
For installation of radio communication equipment	3,080	620	- -
For relocation of telephone lines .	2,747	253	- -
For snow investigations, Frazer experimental area	2,430	77	- -
For changing communication facilities between the Swan Valley Ranger Station and the Alpine Guard Station	869	1,631	- -
Total, Interior Department	9,126	2,581	- -
Cooperative Work, Forest Service:			
Trust fund contributed by cooperators for the accomplishment of certain projects shown below, which are of mutual benefit to the Forest Service and to such cooperators:			
1. Construction and maintenance of roads and trails	245,179	260,000	260,000
2. Construction and maintenance of other improvements	1,029,319	340,000	340,000
3. Protection of national forests and adjacent private land	1,158,991	1,400,000	1,400,000
4. Sale-area betterment and scaling	1,655,877	2,333,000	2,333,000
5. Forest investigations	404,052	401,000	401,000
6. Administration	124,453	90,000	90,000
7. Reforestation	38,099	36,000	36,000
8. Brush disposal	1,275,028	1,311,056	- -
9. Refunds to cooperators	138,200	140,000	140,000
Total, Cooperative Work	6,069,198	6,311,056	5,000,000
Forest Service, State Rural Rehabilitation Corporation Funds (Trust Fund)			
For administration of the El Pueblo grazing project and the Lobato Grant projects in New Mexico for the Farmers' Home Administration	9,959	14,485	13,651

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Public Roads Administration, Department of Commerce (Transfer to Forest Service):			
For carrying out Forest Service responsibilities in the forest highway program	62,703	85,000	85,000
Expenses, Economic Cooperation Administration (Allotment to Agriculture) (Forest Service):			
For expenses incident to the foreign trainee program	- -	a/ 4,920	- -
Expenses of Defense Production, Executive Office of the President (Allotment to Agriculture (Forest Service):			
For carrying out the provisions of the Defense Production Act of 1950.	- -	a/ 35,000	- -
TOTAL, OBLIGATIONS UNDER ALLOTMENTS, WORKING FUNDS AND TRUST FUNDS	14,227,691	13,787,733	10,332,380

a/ Allotment as of December 31, 1950.

PASSENGER MOTOR VEHICLES AND AIRCRAFT

Replacements of passenger motor vehicles. It is proposed to replace 98 cars in the fiscal year 1952. Practically all of these cars will be of model 1942 or older and the average mileage of all cars will be in excess of 60,000 miles. These vehicles have been operated mainly over mountain roads, where surfaces are rough and dusty, grades are steep and curves are numerous and sharp.

Replacements of aircraft. It is estimated that it will be necessary to replace two of the older reconnaissance planes and one cargo plane in the fiscal year 1952 at a net cost of $87,000. The planes to be replaced were acquired in 1945 and have been flown thousands of miles. Since Forest Service planes are operated in large part over rough mountain terrain, they should not be continued in operation unless they are completely airworthy.

FLOOD CONTROL, DEPARTMENT OF AGRICULTURE

Purpose Statement

Flood Control Activities. The Flood Control activities of the Department are carried out pursuant to the Flood Control Act of June 22, 1936, as amended and supplemented. They consist of:

1. The preliminary examination and survey of watersheds authorized by the Congress for investigation and the preparation of survey reports setting forth the watershed conditions and recommending improvement programs, and

2. The installation of watershed improvement measures to retard run-off and waterflow and to prevent erosion which are included in improvement programs approved by the Congress.

The Forest Service and the Soil Conservation Service have been assigned the responsibility, on a territorial basis, for the investigation of watersheds and the preparation of flood control survey reports. They mutually assist each other in matters involving their respective technical specialties. The Bureau of Agricultural Economics consults with them on economic matters and the Production and Marketing Administration prepares from its records information on conservation needs and otherwise assists in the development of watershed improvement programs. Other Federal agencies and State and local agencies are consulted as they have interests or can contribute to the development of recommended programs.

Watershed survey reports, after review within the Department, by other concerned Federal agencies and by the concerned States, are transmitted to the Congress for its consideration. When the recommended programs are approved by the Congress, the Department proceeds with installation of the authorized measures.

Watershed improvement measures to increase the infiltration of water into watershed lands, to retard and control run-off, and to prevent erosion and thus reduce sedimentation of stream channels and reservoirs are being installed on 11 watersheds for which the Congress has authorized improvement programs. This work is handled by the Forest Service and Soil Conservation Service, in cooperation with State and local agencies and land owners and operators.

The flood control activities are carried out by the regular organizations of the agencies handling the various phases of the work with personnel particularly qualified for the kinds of activities involved.

General Basin Investigations. General Basin Investigation activities consist of the preparation of the agricultural phases of comprehensive, integrated resource development programs for the Arkansas-White-Red River and New England-New York areas pursuant to various provisions of law relating to the work of the Department.

Resource development programs for these areas are being developed cooperatively by concerned Federal agencies with appropriate State and local participation, under the Federal Inter-Agency River Basin Committee. By this procedure over-all programs are prepared for the development, use and conservation of all natural resources in the areas, which, after appropriate review by concerned Federal agencies and States, will be transmitted to the Congress for consideration. When the recommended programs are approved, installation of the authorized measures and projects will proceed.

These programs are planned and are being carried out in close collaboration with the people in each area. Their purpose is to provide an effective means by which Federal activities can assist the people to beneficially use and conserve their natural resources and to fulfill local, regional, and national needs.

The Department, in cooperation with Federal and State agencies, is also continuing the preparation of an agricultural program for the Columbia Basin area in accordance with the 1951 General Appropriation Act.

	Estimated, 1951	Budget estimate, 1952
Appropriated funds	a/$6,112,800	$8,900,000

a/ In addition, $3,088,775 available in 1951 from prior year balances.

FLOOD CONTROL, DEPARTMENT OF AGRICULTURE

Appropriation Act, 1951	$10,315,000
Reduction pursuant to Section 1214	-4,200,000
Activities transferred in 1952 estimates to "Operating expenses, General Services Administration" for operation and maintenance of building	-2,200
Base for 1952	6,112,800
Budget estimate, 1952	8,900,000
Increase (direct appropriation)	+2,787,200

Note: Although an increased appropriation of $2,787,200 is requested for this item in 1952, it is estimated that there will actually be a decrease of $301,575 in funds available due to the availability of prior year balances of $3,088,775 in fiscal year 1951.

SUMMARY OF INCREASES AND DECREASES, 1952
(On the basis of available funds)

Decrease for preliminary examinations and surveys (flood control)	-175,600
Decrease in installation of works of improvement on authorized watersheds (flood control)	-337,175
Increase for making General Basin investigations in the Arkansas-White-Red River and the New England-New York areas	+250,000
Decrease due to providing a direct appropriation to the General Services Administration for certain procurement and leasing costs previously paid from this appropriation	-38,800

PROJECT STATEMENT
(Reflecting available funds)

Project	1950	1951 (estimated)	Increase or Decrease: GSA adjustment	Increase or Decrease: Other	1952 (estimated)
1. Preliminary examination and surveys (flood control)	$1,665,017	$1,958,800	-$22,200	-$175,600 (1)	$1,761,000
2. Works of improvement (flood control)	5,952,418	7,200,775	-16,600	-337,175 (1)	6,847,000
3. General Basin Investigations	--	--	--	+250,000 (2)	250,000
Transferred to:					
"Salaries and expenses, Office of the Secretary of Agriculture"	25,000	25,000	--	--	25,000
"Salaries and expenses, Office of Solicitor, Department of Agriculture"	17,000	17,000	--	--	17,000
Total available	7,659,435	9,201,575	-38,800	-262,775	8,900,000

(Continued on next page)

Project	1950	1951 (estimated)	Increase or Decrease: GSA adjustment	Increase or Decrease: Other	1952 (estimated)
Transfer in 1952 estimates to General Services Administration	+2,200	+2,200			
Prior year balance available in 1950 ...	-1,250,410	--			
1950 balance available in 1951	+3,088,775	-3,088,775			
Reduction pursuant to Section 1214	--	+4,200,000			
Total appropriation or estimate	9,500,000	10,315,000			

INCREASES AND DECREASES

(1) A decrease of $512,775 for Flood Control, consisting of $175,600 for Preliminary examinations and surveys and $337,175 for Works of improvement. In view of the current emergency situation these activities have been weighed in terms of their contribution to defense needs. Where it was possible to curtail work without loss of the investment already made or serious impairment of the total program reductions have been made; at the same time the estimates permit some intensification of work that is deemed important in the light of existing and prospective conditions.

Surveys where work is in process are to be pushed to completion. The survey work underway is directed primarily toward those areas where basin-wide resource development planning should proceed.

The following table indicates the estimated obligations for watershed improvement work in 1951 and 1952.

Progress in Carrying Out Authorized Watershed Improvement Programs Through Fiscal Year 1950 and Estimated Obligations, Fiscal Years 1951 and 1952, under FLOOD CONTROL

Watershed and Total Number of Years to Complete Installation	Total Estimated Federal Cost of Authorized Improvements: Costs Shown in survey reports (as of about 1940)	On basis of 6-30-49 costs	Estimated Cumulative (Federal) Obligations Thru F.Y. 1950	Estimated Obligations F. Y. 1951: FS	SCS	Total	Estimated Obligations F. Y. 1952: FS	SCS	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Buffalo Creek (N.Y.) (18)	2,581,400	4,517,450	524,542	--	330,000	330,000	--	294,000	294,000
Colorado, Middle (Texas) (20)	2,693,000	4,712,750	429,092	--	275,000	275,000	--	270,000	270,000
Coosa (Ga., Tenn.) (20)	1,233,000	2,157,750	247,436	16,000	140,000	156,000	15,000	138,000	153,000
Little Sioux (Ia., Minn.) (15)	4,280,000	7,490,000	2,878,176	--	1,000,000	1,000,000	--	908,000	908,000
Little Tallahatchie (Miss.) (20)	4,221,000	6,856,500	669,543	140,000	440,000	580,000	145,000	410,000	555,000
Los Angeles (Calif.) (10)	8,380,000	16,399,250	3,093,170	537,155	195,500	732,655	543,000	200,000	743,000
Potomac (Pa., Va., Md., W. Va.) (24)	859,000	1,431,000	266,286	30,000	135,000	165,000	22,000	116,000	138,000
Santa Ynez (Calif.) (10)	434,000	1,831,500	542,980	213,000	229,500	442,500	152,000	232,000	384,000
Trinity (Tex.) (15)	32,000,000	55,999,000	3,123,789	6,423	1,573,197	1,579,620	--	1,560,000	1,560,000
Washita (Okla., Tex.) (15)	11,243,000	19,675,250	3,383,308	--	1,100,000	1,100,000	--	1,052,000	1,052,000
Yazoo (Miss.) (20)	21,700,000	31,024,250	843,497	140,000	685,000	825,000	155,000	635,000	790,000
Emergencies 1/	--	--	272,855	2,422	12,578	15,000	--	--	--
Total	89,624,400	152,094,700	17,174,674	1,085,000	6,115,775	2/7,200,775	1,032,000	5,815,000	2/6,847,000

1/ Use of Flood Control funds to safeguard lives and property from floods and products of erosion on watersheds suddenly impaired by fire or other natural force is authorized by Sec. 7 of the Flood Control Act of 1938, as amended.

2/ Excludes $18,200 in transfers to Office of the Secretary and Office of the Solicitor in connection with this work.

(2) An increase of $250,000 for General Basin Investigations for the preparation of the agricultural phases of resource development programs for the Arkansas-White-Red River and New England-New York areas in cooperation with other Federal, State and local agencies.

Need for Increase: This approach to the agricultural resource development problem was decided upon after long and careful consideration in recognition of the widespread demand for comprehensive and coordinated programs for the development, utilization and conservation of the resources of the Nation's major river basins and other regions.

The Department is convinced that this concept will dominate the resource programs of the future. It feels very strongly, however, that unless land and water programs are carefully integrated the great benefits of such regional programs to the prosperity and welfare of the Nation will not be fulfilled. The Department has endeavored to bring about this essential integration. It has undertaken the preparation of comprehensive regional agricultural plans to complement the vast engineering plans completed or under way, and to the extent that available resources permit, is participating in cooperative planning efforts. But without the provision of funds specifically for this purpose it is unable to close the wide gap that has been opened between progress in planning for the land and for the development of the water resource by major downstream works by other agencies.

The President, in establishing the joint planning efforts authorized by the Flood Control Act of 1950 and which are already under way in the Arkansas-White-Red River region and in the New England-New York area, directed this Department to participate with other Federal agencies in a balanced planning effort.

The demands on the limited funds available to the Department for this kind of work in the fiscal year 1951 were so critical that it was not possible to initiate the planning efforts in these areas on the scale originally contemplated. In addition to the amount of approximately $125,000 which the various agencies of the Department are absorbing in the Arkansas-White-Red River region in the fiscal year 1951, the Department of the Army agreed to make available to the Department of Agriculture $230,000 for this work pursuant to Section 205 of the Flood Control Act of 1950. Of this latter amount $125,000 had been received as of January 1, 1951. It was necessary that these funds be made available in order that the Department would be in a position to initiate work with the States and other Federal agencies in this cooperative planning effort on a coordinated and integrated basis.

The Department is able to initiate its part of the work in the New England-New York area only on a very limited basis in the fiscal year 1951. This work consists primarily of participation in certain of the Inter-agency Committee activities, the initiation of flood control survey work and the development of work plans and guide lines for the general investigation phases of the program.

In view of the constantly increasing pressure upon the Nation's resources, and the stern necessity for making the most of those resources

if the Nation is to have continued security and prosperity, the provision of the increase requested becomes a matter of critical importance.

Plan of Work: The preparation of resource development programs in the Arkansas-White-Red River and New England-New York areas is proceeding under the Federal Inter-Agency River Basin Committee. Field committees have been established in each of these areas, with the Corps of Engineers representative as chairman, upon which this Department is represented. The agricultural part of the job in each case falls into two main categories:

(a) Developing the conservation, use and management phases of the program. Although conditions vary widely in the two areas, the basic factors to be considered are essentially the same. To the extent that they are involved in each case, determination would be made in each basin of the adjustments, practices and measures needed for improvement of forest, range, and cropland including irrigated and drained land and the means, facilities, educational efforts, credit provisions and other assistance required to get them installed. The economic factors relating to situations in each basin would be considered in the formulation of plans and the economic impacts of the proposed program, particularly upon the agriculture of the area, would be analyzed.

Consideration would be given to the problems on existing irrigated areas and additional areas where irrigation may be feasible, to drainage in certain parts of the lower reaches and on irrigated areas, to agronomic problems in irrigated and other farming areas and to range management problems. The place of shelterbelts, windbreaks and farm woodlands and the development and protection of wildlife habitat would be considered on farm and ranch land. The recommended use to be made of the land and the determination of practices to be recommended would be based on land use capabilities and range condition classes.

Inventories would be assembled of the location, amounts, and value of forests. A determination would be made of the present and the potential economic contribution of forest lands and associated ranges to the basin's economies. Analyses would be made to determine what is needed to fully protect, develop, improve, rehabilitate, and manage the forest land resources with special consideration being given to areas of critical watershed value. A general program would be developed setting forth the extent, character and timing of action needed to bring forest lands and associated range lands to maximum productivity and usefulness.

Maximum use would be made of the data obtained in connection with watershed survey investigations under the Flood Control Acts. Recommendations would take into account the needs for watershed improvement practices to retard run-off and waterflow and prevent erosion together with those needed for other purposes.

(b) Developing the research and investigations phases of the program. A program of research and investigations needed to implement and facilitate the effective operation of the action program in each area would be developed. Attention would be given to the needs for crop, soil, livestock, water, timber, range, forest products, insect and disease control, economic and other research. Information developed on the ability of farmers to carry indebtedness under various instances and on the financial and other details or irrigation and drainage projects within the basins would be obtained.

CHANGES IN LANGUAGE

The estimates include proposed changes in the language of this item as follows (new language underscored; deleted matter enclosed in brackets):

Flood control: For expenses necessary, in accordance with the Flood Control Act, approved June 22, 1936 (Public Law 738), as amended and supplemented, to make preliminary examinations and surveys, and to perform works of improvement, and to plan the agricultural phases of
1 the development of the Columbia Basin area, the Arkansas-White-Red River area, and the New England-New York area, in accordance with the provisions of laws relating to the activities of the Department,
2 including not to exceed $100,000 for employment pursuant to the second sentence of section 706 (a) of the Organic Act of 1944 (5 U.S.C. 574), as amended by section 15 of the Act of August 2, 1946 (5 U.S.C. 55a), to remain available until expended, [$10,315,000] $8,900,000, with which shall be merged the unexpended balances of funds heretofore appropriated or transferred to the Department for flood-control purposes: * * * Provided further, That of the funds available herein,
3 not in excess of [$8,315,000] $6,847,000 may be expended in watersheds heretofore authorized by section 13 of the Flood Control Act of
4 December 22, 1944, for necessary [gulley] gully control, floodwater detention, and floodway structures in areas other than those over which the Department of the Army has jurisdiction and responsibility.

The first change is proposed to provide for use of funds appropriated under this item for developing the agricultural phases of programs for basin-wide resource development in the Arkansas-White-Red River and New England-New York areas, in accordance with the increase proposed in the estimates.

The second change in language proposes the inclusion of authority to obtain personal services on a contract basis for performing certain phases of the flood control work.

The planning and application of watershed works of improvement would be expedited in various instances by the use of the authority contained in this provision, particularly in the watersheds of the Little Sioux River, Iowa; the Washita River, Oklahoma and Texas; the Trinity and the Middle Colorado Rivers, Texas; and perhaps in the other seven watersheds for which remedial programs have been authorized.

For example, in the Sandstone Creek tributary of the Washita, the work plan calls for a number of upstream floodwater retarding and grade stabilizing and sediment control structures. Hydraulic and structural designs for these structures are based upon detailed topographic surveys of the structure sites, foundation exploration, and other watershed data. In obtaining such data the services of several surveyors, draftsmen, etc., may be required for short periods of time, often at scattered locations.

Some of the field survey investigations such as the running of cross sections across flood plains, determination of high water profiles, channel gradients etc., of selected lengths of streams might advantageously be done by contract services under the proposed authority. Such data would be in process of collection on an estimated 9 of the watersheds upon which it is proposed to carry on survey work in 1952.

The kinds of services involved on both operations and survey work could be performed by employees of the Department under regular employment procedure or, where more practical, might be done by contract as proposed herein. If done by contract, the work would be carried on in conformity with standardized Department procedures under the general technical direction of personnel of the Department. In determining whether to use the contract authority in any instance, consideration would be given to the availability of suitable Federal personnel, the effect upon expeditious prosecution of the work and efficient use of Federal funds.

The third change is for the purpose of changing from $8,315,000 to $6,847,000 the limitation on the amount which may be expended in authorized watersheds for gully control, floodwater detention, and floodway structures in certain areas. The revised limitation represents the amount requested for works of improvement on authorized watersheds in the fiscal year 1952.

The fourth change is to correct a typographical error.

STATUS OF PROGRAM

Objective: To reduce damages caused by floodwaters and sediment to agricultural and other property, particularly in the upstream areas, and to reservoirs on the mainstreams.

Method: By land use adjustment and watershed conservation and improvement measures to increase the amount of water temporarily stored in the soil and by the use of vegetation and small supplementary works to impound sediment, help control gullies and stabilize streambanks, and help retard run-off and control its movement into the rivers.

Authorization: Pursuant to the provisions of the Flood Control Act of 1936, as amended and supplemented, the Department of Agriculture is assigned the responsibility for making preliminary examinations and surveys of watersheds authorized for investigation by the Congress, for preparing watershed survey reports recommending improvement programs, and for installing watershed improvement measures included in authorized programs.

Progress with Preliminary Examinations and Surveys

Congress has authorized over 1,000 watershed investigations.

Congress' recent additions bring the total of authorized watershed investigations under the Flood Control Acts to about 1,060. In various instances two or more authorizations are concerned with the same watershed, so the total number of watersheds involved is materially less than this figure.

The Department has completed preliminary examination reports on 171 watersheds and survey reports on 19.

Preliminary examination reports on 141 watersheds have recommended that surveys be made and 30 have not. Reports on 18 watersheds have been forwarded to Congress. Eleven of them recommended programs of improvement which were approved by the Flood Control Act of December 22, 1944, as amended and supplemented. In addition, a report recommending an agricultural program for the Missouri River Basin, including flood control activities, was submitted to the Congress on September 29, 1949.

Survey reports on other watersheds are now in final stage.

Preliminary examination or survey work was carried on in 1950 on 62 watersheds or groups of watersheds and is scheduled for 47 watersheds in 1951. In several instances reports are being prepared on a group of several authorized watersheds. A similar approach may be followed in the future in other instances where it is feasible and more economical. Ten survey reports are now in process of clearance with other Federal agencies and with the States and 22 others are expected to be in that status early in 1951.

The favorable results obtained from measures installed thus far on selected subwatersheds within the 11 authorized watersheds emphasize the importance and need to use devices, such as the grouping of small watersheds for survey and reporting purposes, to more rapidly develop improvement programs and obtain authority for their application in drainage basins where floodwater and sediment damage to agricultural and other property is severe and where mainstream complementary works of the Corps of Engineers, Bureau of Reclamation and others need protection.

Watershed and downstream program recommendations are correlated.

Program recommendations for watershed improvement are based upon data mutually shared by this Department and the Corps of Engineers and other Federal, State and local agencies and proposed improvements are designed to protect mainstream works constructed by the Corps of Engineers and Bureau of Reclamation in addition to watershed lands and property.

Progress with Watershed Works of Improvement

Reduction of floodwater and sediment damage begins where the rain falls - on watershed lands.

The Flood Control Acts provide for the reduction of flood and sediment damages and the control of floods by a combination of watershed improvement measures and mainstream control works. Land use adjustment, conservation and forestry measures within the authorized watersheds increase the capacity of the soil to absorb and temporarily store water. They help to prevent erosion and to reduce the downstream damage to property and reservoirs by sediment. Gully control, floodwater retarding, streambank stabilization and other supplementary measures further assist in these functions and in the orderly routing of run-off from the land into the minor water courses and down to the main streams where the Corps of Engineers has responsibility. The installation period for individual subwatersheds is customarily planned to cover two to four years. The period for entire watersheds is usually scheduled to cover from 10 to 30 years.

Watershed Improvement Work by the Forest Service.

Memoranda of Understanding for flood control objectives were executed in the past year between the Department and the States of Mississippi and Georgia. The fire protection work under them is correlated with the regular cooperative fire protection work of the States and is handled by the same State organizations.

In Mississippi an action program based upon previous plans worked out in detail with soil conservation districts, counties, and the State was put into effect. As a result Holmes, LaFayette and Pontotoc Counties, which are largely within the Yazoo-Little Tallahatchie watersheds, have been added to the State areas receiving fire protection

and similar action is contemplated in other unprotected counties within these watersheds in the fiscal year 1951 as a follow-up on existing fire plans. Work on an action program started in Georgia this year when matching State funds became available.

Some 3,000 forest landowners in the Potomac and Yazoo-Little Tallahatchie watersheds have been furnished advice and recommendations on the proper forestry practices to apply in order to obtain better watershed conditions. Such services include the marking of timber for improvement cuts and pre-mature harvests with due regard for watershed protection needs, preparation of timber inventories, advice on tree planting methods and adequate protection from fire and grazing to improve watershed conditions.

The following described activities are excellent illustrations of watershed rehabilitation and restoration through reforestation and management. They also realistically illustrate the economic value of the timber crop from forests that have stabilized badly eroded lands and reduced flood hazards.

In two subwatersheds in Pontotoc County, Mississippi, four farmers planted 95,000 pine trees during the past two years on land determined to be best suited to tree production based upon a land capability classification prepared by the local soil conservation district with the technical assistance of Department personnel. In the Lower Bluffs subwatershed of the Yazoo watershed in Holmes County, 23 landowners similarly planted 40,000 pine seedlings last year.

During the past year thinnings were made under the guidance of the farm forester assigned to flood control in a 13-year old plantation of loblolly pine in Tate County in the Little Tallahatchie watershed that was set out by the Civilian Conservation Corps. The planting was similar to those now being made on badly eroded land for watershed improvement purposes. Tenant farmers who made the thinnings were thus gainfully employed during a slack season to improve the timber stand for watershed protection and production purposes and simultaneously process fence posts for use upon the land. Similar thinnings were also made in a 13-year old plantation in Holmes County under the direction of the farm forester in the Yazoo watershed. In this area, 1,000 fence posts and 14 cords of pulpwood per acre were harvested from the trees removed in thinning, thus demonstrating the close relationship between good watershed management and forest production.

As of June 30, 1950, the following principal physical works of improvement had been installed and major fire protection equipment items acquired for watershed improvement purposes by the Forest Service and cooperating State agencies:

Measure	Unit	Total Completed or Acquired
Fire Protection		
Roads (constructed or rebuilt)	Miles	13.2
Trails (" ")	"	21
Firebreaks	"	28
Telephone lines	"	15.3
Large water storage tanks	No.	41
Lookout towers	"	1
Fire crew station sites	"	5
Buildings for fire protection work (barracks, cabins, warehouses, garages, offices, miscellaneous)	"	34
Wells and pumps	"	11
Radios (mobile and stationary)	"	87
Fire trucks with equipment	"	15
Fire plows and tractors	"	3
Stabilization of Roadsides	Miles	75.8
Revegetation - Cover Improvement		
Seeding and planting--trees and shrubs	Acres	12,131
Soil stabilizing brush dams	No.	5,127
Emergency seeding following fire	Acres	1,500
Mountain Channel Control		
Barriers	No.	128
Planting	Sq. yds.	242,000
Channel clearing	Acres	29

Watershed Improvement Work by the Soil Conservation Service.

Events of the past year have enlarged the list of indisputable benefits that watershed improvement measures give to farmers and other people. Outstanding proof was in the Owl Creek watershed, a tributary of the Washita River, Oklahoma where the Soil Conservation Service through local soil conservation districts has partly completed the treatment program as authorized for the Washita watershed under the Flood Control Act of 1944.

On May 10 and 11, 1950, the Washita and Red River watersheds of south central Oklahoma received the worst downpour since 1908. Total rainfall during the two days ranged from five inches at Hastings in Jefferson County to 15.5 inches at Purcell in McClain County where 13.6 inches fell in 24 hours.

Runoff water from the hills tore across lowlands and ripped out levees, roadways, and bridges. In six small towns alone more than 1,250 people were made temporarily homeless. Twenty-four homes were completely destroyed. Nearly 30,000,000 tons of topsoil washed away. More than $2,500,000 worth of crops were destroyed, with similar damage to roads and bridges.

Such was not the case, however, on parts of the Owl Creek watershed where treatment had been completed. Rainfall in this area measured 12 to 15 inches during the two-day downpour.

So far the treatment completed on the Owl Creek watershed, in addition to conservation measures on farm and ranch lands, includes the construction of four small floodwater retarding structures in the upper part of the watershed. Structure No. 1 is on the R. H. Atkins farm and has a watershed of about 500 acres. Structure No. 2, somewhat smaller, is on the Leveridge farm with a watershed of about 200 acres. A large part of the area above these structures had been seeded to pasture grasses, mainly little bluestem. Unusually good stands of King Ranch blue stem were established in some diversion channels and waterways.

Below these structures, Mr. Leveridge has about 30 acres of good bottomland which he started farming about 20 years ago. For the first few years the yields in corn and other crops were good. In later years, however, according to Leveridge, the yields began dropping primarily because of flood damages. Years ago, he tried to straighten the creek channel to speed the flow of runoff water. At first this helped, but in a short time flood water again increased its tempo of destroying his crops.

During the May 10 and 11 rains, however, the improved grass ground cover above the structures enabled greater amounts of water to soak into the ground. The runoff was held behind structures No. 1 and 2 and the creek stayed within its channel. Before the downpour Leveridge was doubtful about the protection the two structures would give. Since then, however, he has announced his intention to level this 30 acres to help increase future production. An 8-acre piece of bottomland directly below the Leveridge farm showed no damage from flooding.

About a mile and a quarter to the east is a third similar structure on another small branch emptying into Owl Creek. This floodwater retarding structure has a watershed of about 300 acres, but a greater portion of this area is in cultivation than in the other areas draining into structures No. 1 and 2. About 70 acres are in cultivation and 10 acres in abandoned cropland; 220 acres are in pasture, range, and woods.

But even in view of this land condition and greater runoff, water depth over the spillway of this structure was only 1.8 feet, and this but for a short time. The retarded runoff discharged itself through

the overflow tube for 90 hours, most of which was after the rain had quit and after the peak crests farther down in Owl Creek had passed.

Two farmers who farm 25 acres of cultivated bottomland directly below this structure credit the dam and other treatment with limiting damage to their stand of corn to only $25. "If it hadn't been for the dam," L. F. Powell, one of the farmers, said, "The whole crop would have gone."

A fourth structure, situated about a mile and a quarter still further to the east is on another branch of Owl Creek. Directly below it, a full crop has not been made on a 12-acre bottomland field for the past seven years because of the yearly floods. This bottomland did not flood during the May 10 and 11 downpour this year and the corn stand was undamaged.

As a contrast, along Finn Creek, which is adjacent to Owl Creek and without watershed treatment, heavy damage occurred. L. J. Key, who farms more than 21 acres of bottomland lost his complete crop because of flooding. Last year this land produced more than 34 bales of cotton. The flooding this year deposited from one to 12 inches of sediment over 100 acres of cotton.

One of the landowners in the Finn Creek watershed has spent $35,000 in the past 20 years on levees and channel straightening in an attempt to keep flood waters off of his land. This May 10 and 11 flood water caused more footage breaks in his levees than were left after the water had subsided. The flooding damaged 100 acres of his land, washing out stands of corn and cotton, scouring and washing away productive soil.

The benefits from watershed flood control treatment on upper Owl Creek under this acid test have resulted in an even greater interest among the local people to move ahead with the watershed improvement work to reduce floodwater and sediment damage.

The Soil Conservation Service has assisted local soil conservation districts in the 11 authorized watersheds in planning and installing watershed improvement measures. Work plans have been developed for 554 subwatersheds covering watershed treatment for some 7,175,000 acres or about 24 percent of the 30,102,774 acres in the authorized portions of the 11 watersheds. The work planned thus far indicates that the cost of its installation will be borne approximately 42 percent by local interests and 58 percent by the Federal Government.

As of June 30, 1950, the following Works of Improvement had been accomplished cooperatively by the Soil Conservation Service and local interests:

Measure	Planned as shown in subwatershed work plans	Completed
1. Upstream floodwater retarding structures	537 for retarding of 496,315 acre feet	37 for retarding of 10,367 acre feet
2. Debris basins	2,033	1,030
3. Revegetation (critical flood and silt source areas where vegetative cover provides watershed protection)		
a. Grasses and legumes	437,100 acres	134,996 acres
b. Woody plantings	65,621 acres	12,352 acres
4. Tributary channel stabilization	1,234 miles	195 miles
5. Minor waterways and channel improvement	304 miles	30 miles
6. Diversions	341 miles	74 miles
7. Gully control	27,842 acres	7,750 acres
8. Roadside runoff and erosion control	1,323 miles	289 miles
9. Terraces	11,262 miles	1,229 miles
10. Other minor run-off and sediment detention structures	1,637 each	273 each

PASSENTER MOTOR VEHICLES

The estimates for 1952 propose the replacement of four passenger motor vehicles, constituting less than three percent of the total number of cars operated under this appropriation by the Forest Service and the Soil Conservation Service. The vehicles operated under this item are used by personnel engaged in surveys and in the installation of works of improvement on authorized flood control projects. The cars proposed for replacement will each have mileage in excess of 60,000 miles at the time of their disposal.

SOIL CONSERVATION SERVICE

Purpose Statement

The Soil Conservation Service was established by the Act of April 27, 1935 (16 U.S.C. 590a-590f) and is the agency of the Department which provides technical aid in bringing about physical adjustments in land use that will conserve soil and water resources, establish a permanent and balanced agriculture, and reduce the hazards of floods and sedimentation. The Service carries on the following activities:

1. Makes research studies to determine the character, causes and extent of soil erosion and water loss under varying conditions and to develop, adapt, and improve conservation practices which will adequately protect the land and water resources of the Nation. This work is conducted in cooperation with State Agricultural Experiment Stations, and is closely correlated with the research programs of the agencies in the Agricultural Research Administration.

2. Provides technical and other assistance to locally-organized and locally-controlled conservation districts in the 48 States and the Territorial Possessions in developing conservation farm plans and applying planned practices. This assistance includes (a) making conservation surveys to determine the use-capabilities and needs of each acre of farm and ranch land, (b) technical assistance in developing and applying conservation farm plans which allow for the best possible use by the farmer or rancher of his land, labor, equipment, and financial resources, (c) loan of some special types of equipment not readily available to the farmer but needed to establish certain conservation practices, (d) grant of limited quantities of trees, new or improved strains of grass and legume seed, and other conservation plant materials, and (e) streamflow forecasts in the Western States (based on snow surveys) to provide for efficient seasonal utilization of water available for irrigation.

   As of June 30, 1950, 2,285 conservation districts which covered 82 percent of the total farms of the Nation, had been organized and were receiving assistance from the Service.

3. Under the authority of Title III of the Bankhead-Jones Farm Tenant Act (7 U.S.C. 1011-1012), carries on a development and management program on 74 land utilization projects which cover areas of submarginal land that were acquired by the Department. Revegetation and other development work is being done on these lands in accordance with their use-capability and needs, in order to prevent further damage, achieve proper land use and improve the agricultural economy of the communities affected. After development, the lands and facilities are made available for rental to local farmers and ranchers at equitable rates under specific use conditions. Of the revenue received from use of the land, 75 percent is returned to the Federal Treasury and 25 percent is paid to the counties in which the lands are located, to be used for school and road purposes. The Service

is also responsible for settlement of boundary-dispute claims on the Sebastian Martin Grant Lands in New Mexico (Act of August 11, 1945 (7 U.S.C. 1011 note)).

4. Under the authority of the Acts of May 10, 1939 (53 Stat. 685, 719), October 14, 1940 (U.S.C. 590y-z-10), as amended and supplemented, June 28, 1949 (Public Law 132) and September 6, 1950 (Public Law 760) carries on a water conservation and utilization program. The Service develops irrigated and irrigable land (both Government and privately owned) for efficient use of irrigation water, provides settlement opportunities for farm families through the sale of developed farm units, and assists settlers within the authorized water conservation project areas with their soil and water conservation and land-use problems. This work is being conducted on the five remaining active project areas in 4 Western States.

5. Makes preliminary examinations and surveys under authority of the Flood Control Act of 1936 (33 U.S.C. 701a), and by delegation from the Secretary of Agriculture. Where surveys show the necessity and feasibility and the work is specifically authorized by the Congress, watershed improvement measures are installed to retard runoff and reduce flood water and sediment damage. Installation of watershed improvement measures which affect farm and ranch lands are the assigned responsibility of the Service. These are being installed in eleven authorized watersheds in cooperation with local soil conservation, flood control, and other districts.

The Soil Conservation Service maintains its central office in the District of Columbia, with the majority of its activities highly decentralized to seven regional offices, 48 State and 3 Territorial offices, 86 research locations, 26 nurseries, 5 water conservation projects and approximately 3,000 work unit offices which carry on the technical program and provide assistance for conservation districts, land utilization projects and flood control watershed areas.

As of November 30, 1950, the Soil Conservation Service had 11,567 full-time employees, 231 of whom are in Washington and the balance in the field, and 1,832 part-time employees who are generally employed in the field during the seasonal periods when there is need for additional assistance in applying conservation practices.

	Estimated, 1951	Budget estimate, 1952
Appropriated Funds:		
Salaries and expenses	$54,940,632	$54,278,000
Water conservation and utilization projects	a/ 526,786	500,000
Total	55,467,418	54,778,000

a/ Includes $341,286 available from prior year balances.

SOIL CONSERVATION SERVICE

Summary of Appropriations, 1951 and Estimate 1952

Item	Total estimated available, 1951 a/	Budget estimates, 1952	Increase (+) or decrease (-)
Salaries and expenses, Soil Conservation Service	$54,940,632	$54,278,000	$-662,632
Payments due counties and refunds, submarginal land program (Farm Tenant Act)	240,000	240,000	—
Water Conservation and utilization projects	b/ 185,500	500,000	+314,500
Total	55,366,132	55,018,000	-348,132
Deduct permanent appropriation: Payments due counties and refunds, submarginal land program	240,000	240,000	—
Total, direct annual appropriation	55,126,132	54,778,000	-348,132

a/ Adjusted for comparability with the appropriation structure proposed in the 1952 Budget Estimates.
b/ Excludes $341,286 available from prior year balances.

The Budget estimates propose the consolidation of the current mainhead appropriations "Salaries and Expenses, Soil Conservation Service" (with its two subappropriations, "Soil conservation research" and "Soil conservation operations") and "Land Utilization and Retirement of Submarginal Land, Department of Agriculture" into a single mainhead appropriation "Salaries and Expenses, Soil Conservation Service". The proposal also contemplates the elimination of the subappropriations for "Soil conservation research" and "Soil conservation operations" under the current "Salaries and Expenses", mainhead appropriation, and substitutes in lieu thereof, the financial projects "Development and Improvement of Conservation Practices and Techniques" and "Assistance to Soil Conservation Districts and other Cooperators", respectively.

This consolidation would simplify the appropriation structure and reduce considerably the accounting work of the Service (without loss of necessary administrative controls), since the supervisory, technical, and administrative or "housekeeping" functions for all the activities involved are, with a few exceptions, performed by the same staffs in the administrative offices of the Service. It would also reduce the number of separate accounts required to be maintained in the Treasury Disbursing offices.

The following table compares the existing appropriation and project structure for these items with that proposed in the 1952 Budget Estimates:

PROPOSED CONSOLIDATION OF APPROPRIATION ITEMS OR REVISION OF ACTIVITY SCHEDULES

Salaries and Expenses, Soil Conservation Service
(Based on amounts appropriated for 1951)

Present Structure		Proposed Structure			
		Appropriation Item	Financial Project		
Appropriation Items or Financial Projects	Total Amount	Salaries and Expenses, Soil Conservation Service	Development and Improvement of Conservation Practices and Techniques	Assistance to Soil Conservation Districts and other Cooperators	Development and Management of Land Utilization projects
Salaries and Expenses, Soil Conservation Service:					
Soil Conservation Research:	$1,500,000	$1,500,000			
Erosion control investigations ...	769,000		$769,000		
Drainage and water control investigations in humid areas	433,000		433,000		
Irrigation and water conservation investigations in Western areas..	269,700		269,700		
Water regulation investigations to conserve the soil and reduce fire hazards in the Everglades region of Florida	28,300		28,300		
Soil Conservation Operations:	52,400,000	52,400,000			
Soil and water conservation operations in conservation districts and in cooperation with other Federal and State agencies	50,770,000			$50,770,000	
Operation of conservation nurseries for the furnishing of plants for use in soil and water conservation operations	1,630,000			1,630,000	
Land Utilization and Retirement of Submarginal Land:	1,565,175	1,565,175			
Land development	852,175				$852,175
Management of land and facilities...	713,000				713,000
Total appropriation (excluding permanent appropriation	55,465,175	55,465,175	1,500,000	52,400,000	1,565,175

(a) Salaries and Expenses

Appropriation Act, 1951 (Adjusted - see proposed structure, page 435)	$55,465,175
Reduction pursuant to Section 1214	-520,000
Activities transferred in 1952 Estimates to:	
"Operating expenses, General Services Administration", for operation and maintenance of buildings	-1,343
"Salaries and Expenses, Office of Information" for distribution of motion pictures	-3,200
Base for 1952	54,940,632
Budget Estimate, 1952	54,278,000
Decrease	-662,632

SUMMARY OF DECREASES, 1952

Decrease due to elimination of cost of reconstructing spillway on Greenleaf Lake, Cookson Hills Land Utilization project, Oklahoma	-265,000
Decrease due to elimination of construction cost of a barrier structure on the San Simon Land Utilization project, Arizona	-75,175
Decrease due to providing a direct appropriation to the General Services Administration for certain procurement and leasing costs previously paid from this appropriation	-322,457

PROJECT STATEMENT

Project	1950	1951 (estimated)	Increase or decrease: GSA Adjustment	Increase or decrease: Other	1952 (estimated)
1. Development and improvement of soil conservation practices and techniques	$1,515,328	$1,490,600	-$1,600	—	$1,489,000
(a) Erosion control investigations	(776,051)	(764,200)	(-800)	—	(763,400)
(b) Drainage and water control investigations in humid areas	(440,733)	(430,300)	(-400)	—	(429,900)
(c) Irrigation and water conservation investigations in western areas	(269,698)	(268,000)	(-300)	—	(267,700)
(d) Water regulation investigations to conserve the soil and reduce fire hazards in the Everglades region of Florida	(28,846)	(28,100)	(-100)	—	(28,000)

(Continued on next page)

Project	1950	1951 (estimated)	Increase or decrease: GSA Adjustment	Increase or decrease: Other	1952 (estimated)
2. Assistance to soil conservation districts and other cooperators	51,426,026	51,895,457	-318,457	—	51,577,000
(a) Planning, application, and maintenance of conservation practices	(49,776,512)	(50,265,457)	(-317,457)	—	(49,948,000)
(b) Operation of nurseries for conservation plant material	(1,649,514)	(1,630,000)	(-1,000)	—	(1,629,000)
3. Development and management of Land Utilization Projects	1,232,485	1,554,575	-2,400	-340,175 (1)	1,212,000
(a) Land Development	(523,490)	(845,945)	(-770)	(-340,175)	(505,000)
(b) Management of land and facilities	(708,995)	(708,630)	(-1,630)	—	(707,000)
Subtotal	54,173,839	54,940,632	-322,457	-340,175	54,278,000
Unobligated balance	202,177	—	—	—	—
Total available	54,376,016	54,940,632	-322,457	-340,175	54,278,000
Transfer in 1952 Estimates to:					
"General Services Administration"	+1,343	+1,343			
"Salaries and expenses, Office of Information, Department of Agriculture	+2,562	+3,200			
Transfers in 1951 estimates to:					
"Salaries and expenses, plant industry, soils and agricultural engineering, Agricultural Research Administration", soils, fertilizers and irrigation	+203,400	—			

(Continued on next page)

Project	1950	1951 (estimated)
Transfer in 1951 estimates from: "Research and Marketing Act of 1946, Department of Agriculture".	-96,521	—
Roduction pursuant to Section 1214..	—	+520,000
Total appropriation or estimate	54,486,800	55,465,175

DECREASES

(1) A decrease of $340,175 consisting of:

(a) A decrease of $265,000 due to elimination of the cost of reconstructing spillway on Greenleaf Lake, Cookson Hills Land Utilization project, Oklahoma (non-recurring).

The recreational area of this project including the dam-site was returned to this Service from the Department of the Army on June 23, 1950. All detailed ground surveys of the immediate site of the dam and the watershed area have been completed and the final design work is in process. It is planned to advertise for bids for reconstruction of the spillway in March 1951 and to award the contract in April 1951. Recent price increases for labor and materials since the original estimate was submitted, could cause bids to be received in excess of the funds appropriated for this construction work.

(b) A decrease of $75,175 due to elimination of construction cost of a barrier structure on the San Simon Land Utilization project, Arizona (non-recurring).

Detailed design of this structure is essentially complete and it is planned to advertise for bids in January 1951 and to award the contract for construction as soon as the successful bidder is determined. Construction should be completed by June, 1951 if no difficulties arise due to rising prices or the procurement of construction materials.

CHANGES IN LANGUAGE

The estimates include the following proposed revision and rearrangement of the language for this item which is required by the proposed consolidation of appropriation items:

For necessary expenses for carrying out the provisions of the Act of April 27, 1935 (16 U.S.C. 590a-590f), Title III of the Act of July 22, 1937 (7 U.S.C. 1010-1012), and the Act of August 11, 1945 (7 U.S.C. 1011 note), including research and investigations into the character, cause, extent, history, and effects of erosion, soil and moisture depletion, and methods of soil and water conservation (including the construction and hydrologic phases of farm irrigation and land drainage, and the construction, operation, and maintenance of experimental watersheds, stations, laboratories, plots, and installations); making conservation surveys and plans and establishing measures to conserve soil and water (including farm irrigation and land drainage and such special measures as may be necessary to prevent floods and the siltation of reservoirs); establishment and operation of conservation nurseries; development and management of land utilization project lands and facilities; dissemination of information; purchase and erection or alteration of permanent buildings; operation and maintenance of aircraft; and furnishing of subsistence to employees; $54,278,000: PROVIDED, That the cost of any permanent building purchased, erected, or as improved, exclusive of the cost of constructing a water supply or sanitary system and connecting the same to any such building and with the exception of buildings acquired in conjunction with land being purchased for other purposes, shall not exceed $2,500, except for eight buildings to be constructed or improved at a cost not to exceed $15,000 per building and except that alterations or improvements to other existing permanent buildings costing $2,500 or more may be made in any fiscal year in an amount not to exceed $500 per building: PROVIDED FURTHER, That no part of this appropriation shall be available for the construction of any such building on land not owned by the Government: PROVIDED FURTHER, That in the State of Missouri where the State has established a central State agency authorized to enter into agreements with the United States or any of its agencies on policies and general programs for the saving of its soil by the extension of Federal aid to any soil conservation district in such State, the agreements made by or on behalf of the United States with any such soil conservation district shall have the prior approval of such central State agency before they shall become effective as to such district: PROVIDED FURTHER, That no part of this appropriation may be expended for soil and water conservation operations under the Act of April 27, 1935 (16 U.S.C. 590a-590f) in demonstration projects: PROVIDED FURTHER, That not to exceed $5,000 may be used for employment pursuant to the second sentence of section 706(a) of the Organic Act of 1944 (5 U.S.C. 574), as amended by section 15 of the Act of August 2, 1946 (5 U.S.C. 55a).

[For expenses necessary to carry out the provisions of the Act approved April 27, 1935 (16 U.S.C. 590a-590f), which provides for a national program of erosion control and soil and water conservation, furnishing of subsistence to employees, operation and maintenance of aircraft, and the purchase and erection or alteration of permanent buildings: PROVIDED, That the cost of any building purchased, erected, or as improved, exclusive of the cost of constructing a water supply or sanitary system and connecting the same with any such building, shall not exceed $2,500 except where buildings are acquired in conjunction with land being purchased for other purposes and except for eight buildings to be constructed at a cost not to exceed $15,000 per building: PROVIDED FURTHER, That no money appropriated in this chapter shall be available for the construction of any such building on land not owned by the Government: PROVIDED FURTHER, That in the State of Missouri where the State has established a central State agency authorized to enter into agreements with the United States or any of its agencies on policies and general programs for the saving of its soil by the extension of Federal aid to any soil conservation district in such State, the agreements made by or on behalf of the United States with any such soil conservation district shall have the prior approval of such central State agency before they shall become effective as to such district, as follows:]

[Soil conservation research: For research and investigations into the character, cause, extent, history, and effects of erosion, soil and moisture depletion and methods of soil and water conservation (including the construction and hydrologic phases of farm irrigation and land drainage, and water regulation to conserve the soil and reduce fire hazards in the Everglades region of Florida, except that expenditures for all work in the Everglades region shall be limited to a sum not in excess of funds made available for such work by the State of Florida, or political subdivisions thereof); and for construction, operation, and maintenance of experimental watersheds, stations, laboratories, plots, and installations, $1,500,000.]

[Soil conservation operations: For carrying out preventive measures to conserve soil and water, including such special measures as may be necessary to prevent floods and the siltation of reservoirs, and including the improvement of farm irrigation and land drainage, the establishment and operation of conservation nurseries, the making of conservation plans and surveys, and the dissemination of information, $52,400,000: PROVIDED, That no part of this appropriation may be expended for soil and water conservation operations in demonstration projects: PROVIDED FURTHER, That not to exceed $5,000 may be used for employment pursuant to the second sentence of section 706 (a) of the Organic Act of 1944 (5 U.S.C. 574), as amended by section 15 of the Act of August 2, 1946 (5 U.S.C. 55a).]

<u>The new appropriation language proposed</u> is primarily a rearrangement of the language contained in the present Soil Conservation Research, Soil Conservation Operations, and Land Utilization and Retirement of Submarginal Land items with some minor editorial changes. With two exceptions, the language proposed would not alter the authorities, scope, or nature of the work being conducted.

These two exceptions are:

(1) The new language proposes the elimination of the proviso contained in the present Soil conservation research subappropriation which requires that expenditures for conservation research work in the Everglades region of Florida be limited to a sum not in excess of amounts made available for such work by the State of Florida or political subdivisions thereof. This matching of funds provision was originally inserted in the appropriation language by Congress because the work contemplated was of a special character limited to the Everglades region. Information has already been developed on most of the original special problems which were to be studied in the Everglades and, since the work presently being conducted is now comparable to drainage investigations being conducted by the Service in other parts of the country where no matching of funds is required, it is proposed to eliminate this requirement for the Everglades project.

Funds budgeted for research work in the Everglades area have been greatly reduced over the past several years while expenditures in this area by Florida State agencies have been steadily increasing. In recent years the State agencies have contributed approximately $20 for each dollar spent by the Service. The elimination of the "matching" provision will in no way effect the amount being contributed by cooperators in the Everglades and will save the Federal Government considerable special reporting and auditing expense.

(2) The new language proposes the insertion of the following:

(a) the words "or improved" after the word "constructed" in the phrase "except for eight buildings to be constructed or improved at a cost not to exceed $15,000 per building", and

(b) the phrase "and except that alterations or improvements to other existing permanent buildings costing $2,500 or more may be made in any fiscal year in an amount not to exceed $500 per building" immediately after the phrase "not to exceed $15,000 per building"

The new language proposed to be inserted would permit making necessary moderate improvements or alterations to existing structures to the extent of not more than $500 each. In addition, the insertion of the words "or improved" indicated in (a) above would clarify authority to use such part of the "8-building" limitation as may be necessary when it is in the best interest of the Government to alter or improve existing structures in excess of the $500 limitation rather than to construct new ones.

During the early years of the Service a specific number of buildings was authorized to be constructed in the $2,500 - $15,000 range in order to provide for construction of required repair shops, seed and equipment storage structures, and residences and office facilities at nurseries and research projects which were then being constructed. No residences have been constructed since 1941 nor offices since 1947. Planned construction of other facilities was completed in 1941. No specific building construction is planned for 1952. However, the language proposed would provide for emergencies and permit construction of repair shops, seed or equipment storage sheds, or other necessary facilities in the event existing structures were destroyed or where special unforeseen needs might require additional structures or alteration of existing structures. It would also permit making moderate improvements or alterations in existing buildings which are found necessary from time to time.

STATUS OF PROGRAM

DEVELOPMENT AND IMPROVEMENT OF CONSERVATION PRACTICES AND TECHNIQUES

Current Activities:

Need for Continuous Research Program

Studies are made to determine the character, causes, effects and extent of soil and water loss under varying conditions and to develop, adapt, and improve conservation farming practices and methods which will adequately protect the land and water resources of the nation. The objective of the Soil Conservation Service program of assisting farmers and ranchers to plan and apply conservation is to treat each acre according to its individual needs and use the land in accordance with its capabilities. Newly organized conservation districts which add work areas and problems; new soil, water, and land-use problems which arise in normal field operations; and the continually changing needs of agriculture require the constant efforts of an adequate research staff if sound and permanent conservation is to be achieved. Research activities are conducted in the general fields of erosion control, drainage and water control, and irrigation and water conservation.

Steps in Developing Conservation Practices

Development and improvement of soil and water conservation practices is accomplished by:

1. Laboratory and plot work to develop basic information
2. Experiment Station field scale trials of practices
3. Adaptation and testing of practices for application over extensive areas

The last step is carried out in close cooperation with the "Operations" staff which is working on the planning and application of conservation practices on the land. Successful practices developed are incorporated into the regular soil and water conservation programs of the Service.

Work is Cooperative

This program is conducted in cooperation with the State Agricultural Experiment Stations, and is correlated with the program of the Agricultural Research Administration.

Selected Examples of Recent Progress:

Conservation of Truck Crop Areas

In the trucking area of New Jersey the most effective soil conservation practice is the use of rotations to take the place of continuous row crops. Soil loss measurements from plots at New Brunswick show that growing corn in a rotation with a sod crop reduced soil losses 64 percent, water losses 67 percent, and increased yields 46 percent. For tomatoes grown in a rotation with a sod crop, soil loss was cut 60 percent, runoff 68 percent, and crop yields were 37 percent higher.

Abandoned Land Produces Winter Pasture

A series of upland pastures at Watkinsville, Georgis, are being used in studying conservation practices for use on Class IV and Class VII lands which consist chiefly of steep and severely eroded slopes. Twelve years ago these areas were abandoned and idle and considered worthless for agricultural purposes. By using kudzu to rebuild the soil and then seeding to a winter pasture of adapted grasses and legumes, two of the pastures produced 2.8 and 1.5 tons per acre respectively, of dry forage during the 4-month period of November through February. This provides a means of greatly extending the grazing season and reducing the demand for crops requiring intensive cultivation.

Control of Wind Erosion in the High Plains

Wind tunnel tests are being conducted at the Amarillo, Texas Experiment Station in order to find a means of controlling the serious wind erosion occurring in the High Plains area. Tests on plots protected by sorghum stubble and leaf residues lost only 200 pounds of soil in November but by Spring the cover had disintegrated so badly that, under comparable wind forces, the plots lost 4,000 pounds of soil. Various types of crops must be tested in order to find a protective cover for the spring season when the wind erosion hazard is greatest.

Rill Erosion on Wheat Lands in Idaho

Conservation studies on wheat lands in southeastern Idaho show that where only one conservation practice such as contour tillage was used, the average soil loss over a four-day period amounted to 118 tons per acre. However, on a comparable area where strip cropping, crop rotation, and good stubble mulch were used in combination, the average soil loss was only 4 tons per acre. Various combinations of practices such as stubble mulching, crop rotations, strip cropping and rough tillage are being tested to provide maximum yields with minimum soil and water losses.

Conservation Practices Increase Yields

Reduction of runoff and erosion and the increase of crop residue, which result from conservation practices, provide a marked increase in crop yields. At Lafayette, Indiana, 1949 corn yields from conservation treated watersheds averaged 129 bushels per acre compared to 77 bushels per acre on the untreated areas. Though some seasonal variation in yields is caused by the number, character and time of occurrence of a few major storms, the average increase over a seven-year period through use of conservation practices, is 34 bushels per acre.

Hydrologic Studies

A reduction of 50 percent in the time required for analyzing rainfall and runoff records has been attained in the past year through the improvement and simplification of methods. This will greatly accelerate the obtaining of frequency of peak rates of runoff for small agricultural areas. Such information, which is almost non-existent for 61 out of the 68 major physiographic areas of the Nation, is essential to the economical design of small water control structures.

Sedimentation Studies

The study on rates of sediment production in the Little Sioux watershed of western Iowa has been completed and a report entitled "Sediement Design Criteria for the Missouri Basin Loess Hills of Iowa" has been prepared. The formula developed for determining the amount of storage to be allotted for sediment under different watershed conditions, land-use and cropping practices, has been put into immediate use in designing flood control structures for this area.

A detailed study has been initiated to determine the sand transport capacity of Big Sand Creek which is a tributary of the Little Tallahatchie River. This work is designed to aid in developing control measures for use in flood control work in this area.

The Service has continued its cooperation with the Illinois State Water Survey Division in evaluating the relative effects of land use farming practices, soils, and watershed characteristics on the rate of sediment production and rate of silting of reservoirs in Illinois.

Improved Drainage Boosts Sugar Production

At Baton Rouge, Louisiana, the ponding of surface water on sugar cane cuts has been practically eliminated through improved drainage measures with the result that during the 1949 season the yield of sugar cane on the crowned or drained plots was 10 tons per acre more than that on the normally treated plots. At $7.00 per ton the value of the increased yield

amounts to $70 per acre while the cost of the work was only about $15 per acre. The maintenance of drainage is one of the principal costs in the growing of sugar cane in the State and the practices developed by these investigations are of great value to the sugar industry of Louisiana. More than 70,000 acres have been drained in accordance with the recommendations based on this work.

Drainage of Marl Land

An improved method of drainage by diking, ditching, bedding, and pumping water has been developed for the deep marl areas of the southern Everglades in Florida. This method makes it possible to put the land into cultivation from 20 to 30 days earlier than similar areas drained in the customary manner. Earlier cultivation not only increases the yeild of truck crops but also enables selling the crops on the early market at higher prices.

Drainage Improvements Reclaim Idle Land

Drainage of land in the Imperial Valley in California presents four specific problems: (1) removal of excess water and lowering of the water table, (2) leaching the salt out of the soil and maintenance of a salt balance favorable to plant growth, (3) development of soil management, crop rotations and soil building practices to reclaim wet salty land and (4) development of improved water management practices. Results from work on these problems have been so successful that 69,136 acres of land have been drained, including 43,323 acres of abandoned land, 7,500 acres of raw virgin land and 18,373 acres of land which was low in productivity due to waterlogging and salt. The net increase in value of land due to adequate drainage is estimated at 14 million dollars with an annual net increase in production of 2 million dollars.

Efficient Use of Irrigation Water

Studies of current irrigation practices on typical farms are providing information for the more efficient use of water. Measurements of consumptive use, irrigation efficiencies, and net effective precipitation provide information necessary to determine the irrigation requirements of the crops grown in various areas. This data enables farm planning technicians to recommend improved water management practices which will effect a more equitable distribution of scanty water supplies, increase and improve net yields, and lower costs of production. Investigations in the Salinas and Pajaro valleys in California have been completed and similar analyses are now being made in Lake County and the Tehachapi area. The Service has also been requested to make irrigation efficiency studies in areas around Livermore, Auburn, Placerville, Santa Cruz and in the Central Valley of California.

Lining of Irrigation Canals and Ditches

Less than 5 percent of the 125,000 miles of irrigation canals and laterals in the west are lined. Seepage losses in the unlined canals and laterals amount to between 35 and 40 percent of the total flow of water. Data collected to date from the experimental linings being studied at the River Laboratory at Logan, Utah and on the Richmond Canal in Utah show the following:

1. Earth linings must be protected with non-eriodible coverings

2. Earth materials which have to be compacted to secure low permeability are unsuitable for lining canals

3. Butyl coated fabrics used as membranes must be protected against mechanical injury

4. Seepage losses from canals are greater through the sides than through the bottom

5. All concrete and shotcrete linings show good durability and low seepage rate

6. There appears to be no need for reinforcing materials in concrete canal linings

These studies are being continued in order to develop the most effective and durable low cost canal lining which is essential to the conservation of the present limited water supplies.

Development of Irrigation Water Management and Drainage Practices

In Colorado, Wyoming, Utah, Idaho, Nevada, and Montana there are hundreds of thousands of acres of wild meadow in the high mountain valleys. The yields from these meadows have steadily decreased. The varieties of grass have changed from high food value to low food value plants. Investigations are being conducted in Colorado and Wyoming to develop water and agronomic practices which will improve the varieties of plants, increase the yields and conserve the water and soil resources. These experiments were started in 1949 and physical installations are now complete for studies of well drained land at Pinedale, Wyoming, wet lands at Laramie, Wyoming and similar lands at Gunnison, Colorado. In addition to the controlled plot experiments, field trials on wet and drained lands are being conducted at Gunnison, Colorado. The controlled plots involve water applications, moisture levels, fertilizers, grass varieties, and harvesting practices.

ASSISTANCE TO SOIL CONSERVATION DISTRICTS AND OTHER COOPERATORS

Current Activities:

Soil and water conservation measures are planned and established on the land cooperatively with soil conservation districts. These conservation districts are local units of Government organized under State laws and responsible to the land-owners and operators in the districts and to the State legislatures. They are founded upon the sound principle of local initiative, direction, and control and are formed only in response to the petition and favorable referendum vote of the land owners and operators who are carrying on agricultural operations within the proposed district boundaries. Conservation districts have been organized in all 48 States, Hawaii, Alaska, Puerto Rico, and the Virgin Islands.

The following types of assistance are being furnished to conservation districts in carrying out locally-adapted programs of soil and water conservation:

1. The services of soil scientists who make the necessary physical inventories of the land to secure data (soil type, degree of slope, character and extent of erosion, present land use, etc.) needed to determine the use capabilities and conservation needs of each acre of land.

2. The services of soil conservationists, engineers, and other agricultural specialists and aides who help farmers and ranchers develop and apply individual conservation farm or ranch plans. (Soil and water conservation practices included in such conservation plans allow for the best possible use of the farmer's land, labor, equipment, and financial ability to do conservation farming on his land.)

3. The use of special equipment needed to facilitate establishment of conservation practices but which is of a kind that is beyond the purchase ability of an individual operator or for other reasons not readily available to the farmers and ranchers within the conservation district.

4. The grant of limited quantities of trees, new or improved strains of grass seed, and other plant materials which serve to control erosion and also have economic value.

5. In the Western States, streamflow forecasts — developed from snow surveys — which serve as a basis for efficient seasonal utilization of water available for irrigation and other purposes.

In cooperation with other Federal and State agencies, limited assistance is also given to farmers and ranchers outside conservation districts. This assistance develops a better understanding locally of erosion and land-use problems and encourages more widespread adoption of conservation farming methods.

Selected Examples of Recent Progress:

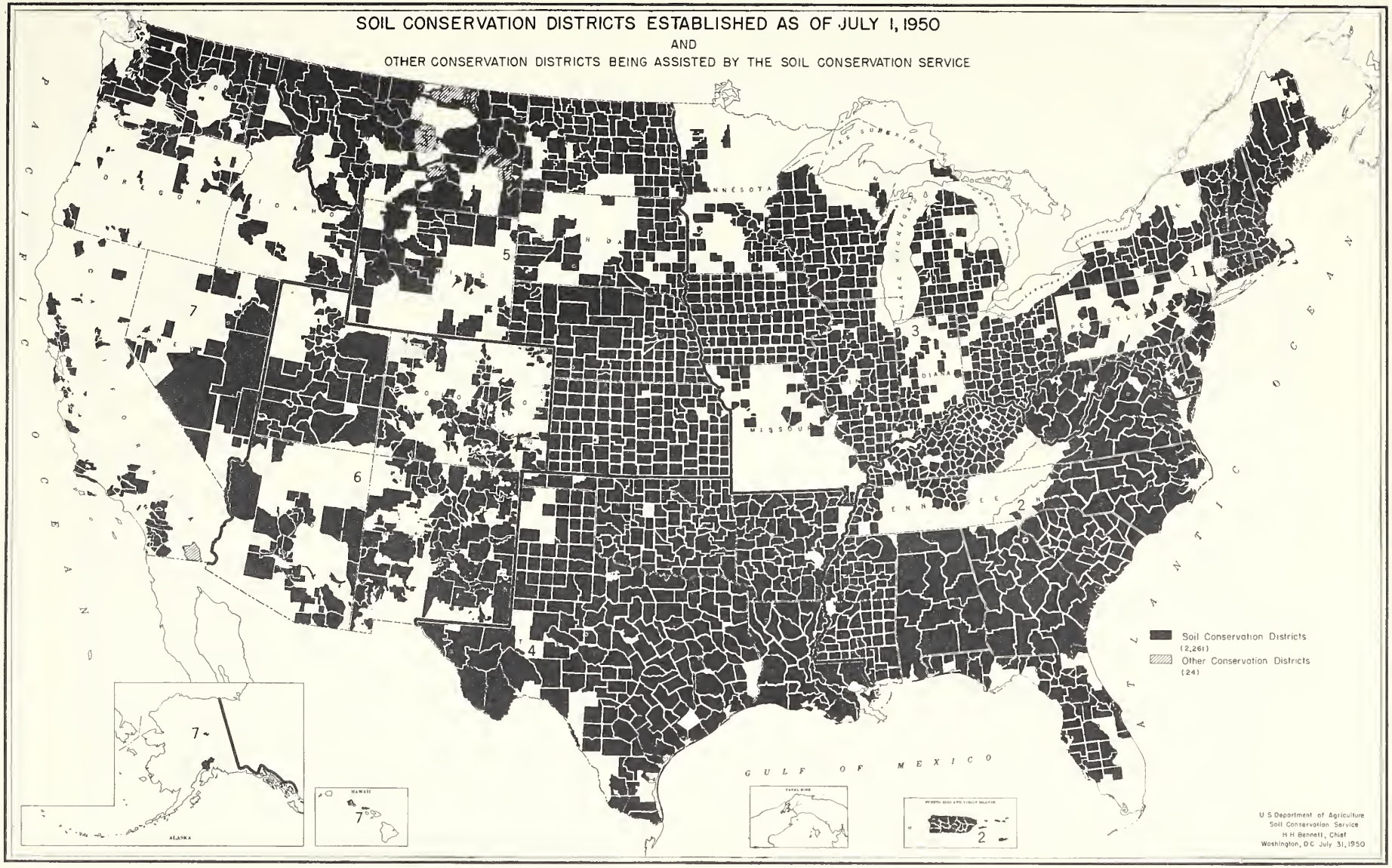
Rate of Organization of Conservation Districts

During the fiscal year 1950 local farmers and ranchers organized 121 new conservation districts and 182 additions to existing districts comprising nearly 80,000,000 acres. As of June 30, 1950, the 48 States and the Territorial Possessions, all of which have enacted soil conservation districts legislation, had organized a total of 2,285 conservation districts covering an area of 1 1/4 billion acres. It is anticipated that 150 additional districts will be organized in each of the fiscal years 1951 and 1952. Approximately 82 percent of the total farms in the nation are now within the boundaries of organized conservation districts. It is believed that this will increase to 87 percent by June 30, 1951 and to 92 percent by June 30, 1952.

Number pf Farms and Acreage in Conservation Districts

Date	Number of Districts Organized	Total Acres in Organized Districts	Approximate Acres in Farms	Number of Farms in Districts
Actual				
June 30, 1949	2,164	1,178,763,172	795,859,825	4,571,693
Average per district		544,715	367,772	2,113
June 30, 1950	2,285	1,253,483,926	841,870,872	4,771,635
Average per district		548,571	368,434	2,088
Estimated				
June 30, 1951	2,435	1,335,800,000	897,137,000	5,100,000
Average per district		548,583	368,434	2,094
June 30, 1952	2,585	1,418,100,000	952,402,000	5,413,000
Average per district		548,588	368,434	2,094

The attached map shows the conservation districts which had been organized as of July 1, 1950.



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Conservation Education

Forty-six "Extension" soil conservationists (33 are employed cooperatively by the Soil Conservation Service and the Extension Service) are responsible for the educational phases of the soil and water conservation program. In the past year, a great deal of emphasis has been placed on conservation work with teachers, pupils, and parents. The Montana Conservation Council has recommended to the State Board of Education that conservation courses be required by all teachers as part of their regular course prior to graduation. In Iowa, 31 one-day teacher institutes were held and the program for all grade school teachers was devoted to conservation. A handbook for teaching conservation was given to those in attendance by the State Department of Public Instruction. As a result of one of these institutes, one soil conservation district conducted seven tours for 1,800 pupils, teachers and parents. The States of Nevada and Colorado issued a guide for use of teachers in teaching conservation to all grades and in South Carolina the State Department of Vocational Agriculture issued a bulletin as a conservation teaching guide for vocational agriculture instructors. Many of the States held contests for 4-H and FFA members, chief of which was the Annual Grass Judging Contest sponsored by the Texas State Association of Districts, in which 50 4-H and FFA teams participated.

National Interest in Conservation of Soil and Water Resources

It is an accepted fact that failure to recognize the damages of erosion has contributed largely to the excessive mistreatment of land in this country. The necessity for protecting our remaining land and keeping it permanently productive has been acknowledged as the responsibility of all the people in the Nation. Farmers, industrial concerns, civic organizations, business and professional men, educators, and others have made a united effort to create interest in conservation by sponsoring many local, State, and National conservation events. A few of the major events of the past year were:

1. The National Soil Conservation Essay contest sponsored by a national farm organization. Thousands of essays on conservation of our basic resource were written by school children for competition in the State contests which prefaced the national event.

2. By special proclamation of the respective Governors, five States observed Soil Conservation Week. Newspapers and radio stations devoted special programs to conservation, ministers gave sermons on soil stewardship and many field days and other supporting activities were carried on throughout the week.

3. In one State 32 field days were held in the months of August and September with 130,000 people in attendance. The largest one,

sponsored by a local newspaper and radio station, had an attendance of 70,000 who watched the conversion of a farm to a conservation system of farming in one day.

4. The Federal Reserve Bank of Richmond sponsored a tour, for 200 bankers, of conservation farms in two Maryland Soil Conservation Districts. Permanent measures of land protection were pointed out as evidence of the solidity of investment in conservation farming.

5. Air tours gained considerably in popularity as evidenced by the 300 flying trips in one day by farmers in a Minnesota Soil Conservation District. District cooperators and their wives were given a free ride over their respective farms through the cooperation of the Cottonwood Soil Conservation District, local business men, and the Flying Farmers. In the Adams County conservation district in Ohio, the air tour, sponsored by the local bankers, had to be continued for an extra day in order to provide service for the enormous crowd desiring a "bird's eye" view of conservation on the land.

6. An Indiana newspaper has consistently devoted a large amount of space to articles on conservation in an effort to inspire farmers to conserve our most precious resource. Many of the news stories are taken from actual experience of conservation farmers in Indiana. As a culmination of this effort, the newspaper has recently published a thirty-page illustrated booklet of articles which have appeared on its pages in the past two years. It is distributing it toall interested people as a reminder that the future of our Nation rests basically on the fertility and productivity of our soil.

Conservation Surveys, Planning and Treatment Accomplishments

Type of Work	Unit	Actual 1949	Cumulative to 6/30/50	Estimated 1951	Estimated 1952
Conservation surveys ..	Acres	31,467,217	334,776,969	33,000,000	35,500,000
Individual farm and ranch plans	No.	132,752	780,473	133,500	133,500
Farm and ranch planning	Acres	38,777,825	217,994,068	39,000,000	39,000,000
Conservation treatment	Acres	26,071,342	120,929,693	26,500,000	26,500,000

Land Treatment in Conservation Districts

The following table shows some of the major conservation practices that were applied in conservation districts with the assistance furnished by the Soil Conservation Service:

Name of Practice	Unit	Applied During Fiscal Year 1949	Applied During Fiscal Year 1950	Cumulative to June 30, 1950 1/
Contour farming	Acres	3,352,922	3,491,511	22,648,513
Cover cropping	Acres	2,614,797	3,111,387	13,347,926
Stubble mulching	Acres	6,611,273	7,140,297	35,119,426
Strip cropping	Acres	692,995	829,200	5,760,629
Seeding pasture and range	Acres	1,358,856	1,876,832	7,037,375
Woodland management	Acres	3,077,106	3,391,551	13,848,586
Tree planting	Acres	107,056	126,784	650,982
Farm and ranch ponds	Number	31,206	37,780	177,513
Terraces	Miles	96,621	100,612	719,817
Diversion channels	Miles	5,126	5,892	25,963
Farm drainage	Acres	1,103,412	1,161,402	5,061,554
Irrigation land preparation	Acres	254,905	315,519	1,162,043
Improved water application	Acres	562,667	617,606	2,804,036
Field windbreaks	Miles	1,268	1,435	8,392

1/ These data are for first-time application only and do not include duplication of acreage for reapplication or maintenance of those same practices year after year.

"Operations" Costs and Accomplishments

Item	Obligations	Accomplishments	Cost per Acre
Fiscal Year 1950			
Conservation surveys	$3,653,695	31,467,217	$0.12
Farms and ranch conservation planning	15,406,245	38,777,825	0.40
Conservation treatment	29,926,971		
Improvement and maintenance of program on farms and ranches ..	2,439,115		
Total obligations	51,426,026		
Fiscal Year 1951 (Estimated)			
Conservation surveys	3,687,600	33,000,000	0.11
Farms and ranch conservation planning	15,549,000	39,000,000	0.40
Conservation treatment	30,197,157	26,500,000	1.14
Improvement and maintenance of program on farms and ranches ..	2,461,700		
Total obligations	51,895,457		
Fiscal Year 1952 (Estimated)			
Conservation surveys	3,664,000	35,500,000	0.10
Farms and ranch conservation planning	15,452,500	39,000,000	0.40
Conservation treatment	30,014,200	26,500,000	1.13
Improvement and maintenance of program on farms and ranches ..	2,446,300		
Total obligations	51,577,000		

Legume Pastures Prove Value of Good Land-Use

Many farm conservation plans provide for a decrease in the number of acres devoted to grain crops and an increase in acres of good legume pasture and hay in order to treat the land in accordance with its capability and need. In addition to providing for indefinite use of the land by conserving the topsoil, the following examples also prove the immediate value of proper land-use:

1. A State-owned farm in Iowa provides for 80 acres of legume pasture and 90 acres of brome alfalfa hay for use by a dairy herd of about 110 cattle. The first day that cows were turned in the new pasture, milk production increased 400 lbs. and steadily increased to a gain of 800 lbs. daily. Furthermore, the grain ration was reduced by one-half, corn ensilage was reduced from 40 lbs. to 15 lbs. per head and dry hay has been eliminated from the ration.

2. On a Southern Illinois farm approximately one acre of Ladino clover was used in the spring and early summer for hog pasture. Thirty-three hogs plus the brood sows were pastured and the 33 head were marketed in less than six months at 200 lbs. average weight. Average feeding standards would require 15 bushels of corn and 70 lbs. of protein supplement per head to reach this weight, or a total of 495 bushels of corn and 2,310 lbs. of supplement. Actually only 400 bushels of corn and 1,700 lbs. of supplement were used thereby giving the one acre of ladino pasture a value of $110 worth of corn and $24 worth of protein supplement.

3. Production records from a pasture of second year alfalfa-brome-lespedeza and ladino clover shows thirty-six yearling steers were pastured 96 days on 12 acres. The steers gained 429 lbs. and were sold for 22 cents per pound, a gain of $94.38 per acre. An adjoining field of wheat, regarded as better land, showed a net profit of $17 per acre.

Snow Surveys and Water Supply Forecasting

Measurements of snow cover at the end of the snow accumulation season continue to be made over more than 1,000 snow courses in the eleven Western States. The general relationship between the snow cover and runoff has been established for the major watersheds at key gaging stations. From these relationships forecasts of water supply are made each spring for these major gaging stations. Continued effort is being directed toward a refinement of the snow cover-runoff relationships so as to provide more accurate forecasts on the major streams and to extend such forecasts to all minor tributaries above the points of diversion for irrigation use.

Water Supply Forecast Committees of interested users and agencies have been set up on the Columbia, Missouri, Colorado and Rio Grande Rivers. These committees meet annually and review snow cover and other data and develop the water supply forecasts for the respective areas. These forecasts are utilized by irrigation, power, municipal, and industrial users and the information relative to the snow cover is of great value in predicting flood stages.

Conservation Plant Material

The annual increase in the number of soil conservation district cooperators, who are applying soil and water conservation measures to their lands, creates an unprecedented demand for plant materials. The Service has long recognized the fact that to produce the great amount of plant material needed will require the best efforts of both public agencies and private enterprise. Some expansion of production is evidenced by the fact that Soil Conservation District nurseries in the States of Michigan and North Dakota alone produced over two million trees. It is estimated that nearly 200 million pounds of grass and legume seed were harvested through direct and indirect Service effort during the past calendar year. The initial source of the latter can in many instances be traced back to small amounts of seed produced in Service nurseries and granted to districts for seed increase plots.

During the past year the Service operated 26 nurseries for the production of seeds of new, improved or uncommon kinds of grasses or legumes, and for the production of trees and shrubs needed for conservation operations. The plant material produced in Service nurseries is granted to districts, which make it available in small amounts to district operators. The total amount of grass and legume seed produced or harvested through Service nursery facilities amounted to 1,145,000 pounds. Production of vines such as kudzu and stolons of grasses such as Coastal Bermuda, amounted to nearly 32,000,000 plants. Approximately 18,418,000 trees were produced and 5,243,000 were purchased. Production of shrubs for use in windbreaks and wildlife plantings amounted to over 15,416,000 plants.

Nursery observational work is providing species and strains of grasses and legumes which have high soil conservation qualities. It also serves as a medium for exchange of foreign and domestic seed and technical information useful in the propagation and utilization of improved plant materials for soil conservation.

DEVELOPMENT AND MANAGEMENT OF LAND UTILIZATION PROJECTS

Current Activities:

Land Areas Administered

The Service develops and manages 74 submarginal land projects in 30 States and administers the leases on 33 other areas which are managed by State agencies. These projects cover 7,332,060 acres, acquired by the Department during the period 1938 to 1942, which had become submarginal or unsuitable for cultivation because of location, natural infertility, loss of productivity through misuse, or other physical factors. Revegetation and other development work is being done on these lands in accordance with their use-capability and needs, in order to prevent further damage, achieve proper land use, and improve the agricultural economy of the communities affected. Also included in the work carried on under this appropriation item is the settlement of certain boundary-dispute claims on the Sebastian-Martin Grant Lands in New Mexico.

Land Development

Approximately 600,000 acres of the land administered by the Service are adapted to forestry development and management, 6,300,000 acres are best suited for grazing purposes and the remainder is suitable for cropping, wildlife, recreation and miscellaneous uses. Development work consists of applying erosion control measures, establishing vegetative cover on abandoned crop land, improving and seeding land which is suitable for grazing purposes, developing wells, springs and other stock water facilities, fencing pasture lands, tree planting, constructing roads, firebreaks, trails, lookout towers, telephone lines, and buildings, and occasionally the development of recreation facilities. Much of the land area has been developed and is being made available to local farmers and ranchers at equitable rates under specific use conditions, thereby enabling them to shift to a more sound land-use program on their own land and also produce supplemental income.

Management of Land and Facilities

The management, maintenance, and protection of approximately seven million acres of land requires repair and upkeep of fences, stock water facilities, telephone lines, buildings, etc., handling of permits for use of the land for grazing, haying, cropping and timber harvesting, and patrolling of fire lanes and fire fighting. Recreational facilities are handled through concessionaires' contracts. There has been no land purchase since 1942 but exchanges of Government-owned land for private land are being made, where such transactions will round out economic operating units for both the Government and private owners.

Selected Examples of Recent Progress:

Current Development Accomplishments and Workload

While good progress has been made in developing submarginal lands acquired by the Government, much remains to be done. Efforts are being concentrated on types of development work which will properly protect the land, provide maximum benefits from their use by local people, and bring maximum cash returns on the Government's investment. Although early completion of the remaining development work is the primary objective, provision must be made annually to carry out an adequate maintenance and management program.

The following table shows the actual amount of some of the more important items of development work completed during the fiscal year 1950, estimated amounts for fiscal years 1951 and 1952, and the estimated balance remaining to be done after June 30, 1952:

Type of Work	Unit	Actual F. Y. 1950	Estimated F. Y. 1951	Estimated F. Y. 1952	Balance to Complete
Seeding range and pasture	acres	50,036	44,000	44,000	61,873
Seed bed preparation	acres	12,968	27,000	37,000	44,439
Liming	acres	1,601	1,500	1,500	18,626
Fertilizing	acres	2,382	2,500	2,500	32,579
Mowing and brushing	acres	5,897	6,000	6,000	27,356
Fencing	miles	601	600	600	559
Stock water source	number	153	160	160	165
Tree planting	acres	2,537	3,000	3,000	74,430
Fireguards	miles	119	100	100	434
Roads and trails	miles	81	60	60	271
Administrative buildings	number	10	6	6	50

Use of Land Utilization Project Lands and Facilities

Land Utilization project lands and facilities are made available to local farmers and ranchers at equitable rates under specific use conditions. During the calendar year 1949, 6,751 use permits were issued to local farmers and ranchers. The following table shows the four major uses of the land in the calendar years 1948 and 1949:

Calendar Year and Use	Number of Operators Using	Acres Used	Unit Measure of Production
1948			
Grazing	5,975	6,454,355	1,712,434 A.U.M.
Haying	575	—	19,330 tons
Cropping	433	25,850	—
Woodland production ...	736	—	26,657,864 bd. ft.
1949			
Grazing	5,327	6,386,159	1,706,803 A.U.M.
Haying	511	—	20,096 tons
Cropping	370	23,513	—
Woodland production....	543	—	30,619,567 bd. ft.

Revenue Received from Use of Land Utilization Projects

The income from the Government-owned Land Utilization project lands administered by the Service amounted to $925,820 for the calendar year 1949. Of this amount 25 percent or approximately $231,455 was paid in lieu of taxes to the counties in which the lands were located. The following table shows the types of revenue and the amount received for each, for the calendar years 1948 and 1949:

Type of Revenue	Calendar Year Receipts	
	1948	1949
Grazing	$684,995	$669,599
Haying	17,567	12,637
Cropping	68,591	46,884
Building occupancy	4,166	4,219
Recreation	26,056	31,171
Mineral royalties	17,170	3,966
Easements	692	2,108
Forest products	166,872	150,596
Salvaged improvements	2,449	1,020
Sale of seed	2,880	2,324
Unclassified	4,355	1,296
Total	995,793	925,820

It is estimated that revenue from these projects will amount to $900,000 for each of the calendar years 1950 and 1951. Payments to counties in lieu of taxes would amount to $225,000 each year.

Land Exchanges

General land purchases under the Land Utilization program were discontinued at the close of the fiscal year 1942. No new land purchases are contemplated during either of the fiscal years 1951 or 1952. However, applications continue to be received for the exchange of private lands for Government-owned lands. The following table shows the status of land exchange work:

Item	Cases	Federal Land Released		Private Land Acquired	
		Tracts	Acres	Tracts	Acres
Applications received 1950	83	203	37,554	164	47,697
Applications completed 1950	60	122	24,880	107	46,195
Applications pending July 1, 1950	132	350	66,796	288	88,300

Sebastian Martin Boundary Dispute

Settlement of claims to certain so-called Sebastian Martin Grant lands, now a part of the Grant Lands Land Utilization Project, New Mexico, is also included in the work authorized to be carried on under this appropriation item. Under the provisions of Public Law 179, 79th Congress, the Secretary of Agriculture is authorized to settle disputed claims to these lands. Out of the possible 75 claims that may develop, a total of 41 parcels involving 214.53 acres have been returned to private ownerships. 14 of these parcels involving about 68.27 acres were settled during the fiscal year 1950. While it is impracticable to estimate how many of the claims will be submitted during the fiscal year 1951 and 1952, 26 other parcels are now in process of determination as to eligibility for return.

(b) Land Utilization and Retirement of Submarginal Land

The 1952 Budget estimates propose the transfer in the estimates of this item to the appropriation "Salaries and Expenses, Soil Conservation Service". Therefore, the work formerly reported under the heading "Land Utilization and Retirement of Submarginal Land" is now included under (a) "Salaries and Expenses, Soil Conservation Service". (See proposed structure, page 435).

CHANGE IN LANGUAGE

The estimates propose deletion of language for this item as follows:

> [For expenses necessary to carry out the provisions of title III of the Bankhead-Jones Farm Tenant Act, approved July 22, 1937 (7 U.S.C. 1010-1012), and the provisions of the Act approved August 11, 1945 (7 U.S.C. 1011 note), $1,565,175.]

This change in language is in accordance with the proposed consolidation of this item with "Salaries and expenses, Soil Conservation Service".

(c) Water Conservation and Utilization Projects

Appropriation Act, 1951	$500,000
Reduction pursuant to Section 1214.....	-314,500
Total available in 1951 and Base for 1952.....	185,500
Budget Estimate, 1952	500,000
Increase.....	+ 314,500

Note: Although an increased appropriation of $314,500 is requested for this item in 1952, it is estimated there will be a decrease of $26,786 in total funds available due to availability of prior year balances of $341,286 in fiscal year 1951.

SUMMARY OF INCREASES AND DECREASES, 1952
(on an Available Funds Basis)

Decrease due to anticipated completion of development work on the Buffalo Rapids Division I project Montana ($2,500) and on the Buford-Trenton project, North Dakota ($44,000)	- 46,500
Decrease due to providing a direct appropriation to the General Services Administration for certain procurement and leasing costs previously paid from this appropriation	- 900
Increase for carrying out scheduled land development work on the Angostura project, South Dakota	+ 20,614

PROJECT STATEMENT
(on an Available Funds Basis)

Project	1950	1951 (estimated)	Increase or decrease: GSA Adjustment	Increase or decrease: Other	1952 (estimated)
1. Land development	$303,663	$476,786	- $900	-$25,886(1)	$450,000
2. Land management, settlement and technical guidance	35,462	50,000	—	—	50,000
Total obligations..	339,125	526,786	- 900	- 25,886	500,000
1949 balance available in 1950	-680,411				
1950 balance available in 1951	+341,286	-341,286			
Reduction pursuant to Section 1214	—	+314,500			
Total appropriation or estimate	—	500,000			

INCREASES OR DECREASES

(1) A net decrease of $25,886 composed of:

(a) A decrease of $46,500 due to anticipated completion of development work on the Buffalo Rapids Division I Project, Montana ($2,500) and on the Buford-Trenton Project, North Dakota ($44,000).

The major portion of the development work on these two projects is essentially complete and a number of developed tracts have been sold to qualified farm families. It is anticipated that both the remaining development work and the sale of the remaining farm units can be completed by the end of the fiscal year 1952.

(b) An increase of $20,614 on the Angostura Project, South Dakota in order to carry out scheduled land development work.

Completion of surveys and the staking out of the main distribution canal on the Angostura project will now permit carrying out the scheduled land clearing, land leveling and construction of farm ditches, drains and outlet structures necessary for farm irrigation systems. Land capability and topographic surveys and other preparatory work has been completed, the necessary technical supervisory staff has been assembled, and development work can now proceed at a accelerated rate.

CHANGES IN LANGUAGE

The estimates include proposed changes in the language of this item as follows (new language underscored; deleted matter enclosed in brackets):

For expenses necessary to carry into effect the functions of the Department under the Acts of May 10, 1939 (53 Stat. 685, 719), October 14, 1940 (16 U. S. C. 590y-z-10), as amended and supple-
1 mented, [and] June 28, 1949 (Public Law 132), and September 6,
2 1950 (Public Law 760), relating to [the construction, operation, and maintenance of] water conservation and utilization projects, to remain available until expended, $500,000, which sum shall be merged with the unexpended balances of funds heretofore appropriated or transferred to said Department for the purposes of said Act.

The first change proposes deletion of the word "and" after "supplemented" and insertion of the phrase "and September 6, 1950 (Public Law 760)," after "(Public Law 132)". This change is proposed in order to include in the language reference to recent legislation which authorizes the execution of quit claim deeds for mineral interests on project lands sold. Public Law 760, 81st Congress, 2nd Session, approved September 6, 1950, authorizes and directs the Secretary "to sell all mineral interests now owned by the United States which have been reserved or acquired by it under any program heretofore administered by the Resettlement Administration or the Farm Security Administration * * * *". The water conservation and utilization projects program was administered by the Farm Security Administration prior to July 1, 1945.

The second change proposes deletion of the words "the construction, operation and maintenance of" for the sole purpose of simplifying and shortening the wording of the item, and will in no way affect the scope or nature of the work being conducted.

STATUS OF PROGRAM

Current Activities:

The water Conservation and Utilization (Wheeler-Case) program is carried on cooperatively with the Bureau of Reclamation which has as its responsibility the construction of the primary water supply features such as dams, reservoirs and principal canals. The Soil Conservation Service is responsible for developing irrigated and irrigable project lands for efficient application and use of irrigation water; with providing settlement opportunities for farm families and veterans; and with securing efficient land use and conservation of soil and water resources on the farms developed.

Land Development

Extensive land preparation is essential to the changing of dry farm and range land to a well designed and constructed system of irrigation farming which will prevent waste of soil and water resources and permit maximum use of available irrigation water. Development of irrigable land includes such activities as making detailed land classification and topographic surveys, clearing and leveling land, subdividing land into economic-sized units, and the construction of farm ditches, laterals, drains, and other water control structures.

Land Management, Settlement, and Technical Guidance

This work consists of the protection and management of Government-owned or controlled lands and facilities and leasing of the farming units under specific use conditions, prior to development and disposal to private farmers. As project lands are developed they are sold to qualified farm settlers selected by a local advisory board. The selling price of the completed farm unit is based on the earning power of the land and is calculated to return to the Federal Treasury an amount not less than the reimbursable cost of development with interest at 3 percent over a 40-year amortization period. Technical guidance, to insure efficient irrigation and conservation farming methods, is furnished to operators of both the Government-owned and the privately-owned lands within the project area.

Of the 19 projects originally authorized for development 6 are inactive due to inflationary land prices, lack of primary water supply, or other reasons, 8 are completed, 3 are scheduled to be completed during the fiscal year 1952, and the remaining 2 are scheduled to be completed by 1956.

Recent Progress:

Project Authorizations and Obligations

The current Presidential project authorizations and amounts obligated through June 30, 1950 for each Water Conservation and Utilization Project under the respective funds and programs which were scheduled to contribute to the development of the projects are shown in the following table:

Project Name	Present Project Authorization	Obligations through June 30, 1950: Wheeler-Case Funds	Great Plains Funds	Contributed Funds	Total
Angostura	$1,484,000	$419,144	—	—	$419,144
Balmorhea	569,000	—	—	—	—
Bitterroot	752,000	189,239	—	—	189,239
Buffalo Rapids I	535,000	83,013	$209,952	$224,405	517,370
Buffalo Rapids II	770,000	248,367	345,000	134,486	727,853
Buford Trenton	1,094,000	—	667,710	264,838	932,548
Dodson	84,000	51,485	—	—	51,485
Eden Valley	1,795,924 a/	115,617	154,594	5,061	275,272
Intake	41,000	20,817	—	—	20,817
Mancos	473,000	366,880	—	—	366,880
Mirage Flats	687,300	479,298	170,000	36,837	686,135
Missoula	133,000	65,297	—	—	65,297
Newton	75,500	74,230	—	—	74,230
Post Falls	196,000	196,489	—	—	196,489
Rapid Valley	170,000	7,117	15,042	—	22,159
Saco Divide	480,000	—	405	—	405
Scofield	350,000	119,531	—	12,200	131,731
Total direct project costs	9,689,724	2,436,524	1,562,703	677,827	4,677,05
Project investigations and surveys	—	233,473	—	—	233,473
General administration:					
Farm Security Administration	—	349,091	—	—	349,091
Office of Production	—	4,137	—	—	4,137
Office of the Solicitor	—	59,957	—	—	59,957
Soil Conservation Service	—	520,598	—	—	520,598
Total obligations through 6/30/50	—	3,603,780	1,562,703	677,827	5,844,310

a/ Current estimates for total cost of project. Public Law 132, 81st Congress, 6/28/49, authorized expenditure of such funds as necessary to complete project.

Estimated Obligations by Project, 1951 and 1952

The following table shows, by project, the estimated obligations to be incurred in the fiscal years 1951 and 1952 under this program (balances of "Great Plains" funds are also shown in order to facilitate program analysis):

Project	1951 Estimated			1952 Estimated		
	"Wheeler-Case" Funds	"Great Plains" Funds	Total	"Wheeler-Case" Funds	"Great Plains" Funds	Total
Angostura	$200,000	—	$200,000	$220,614	—	$220,614
Buffalo Rapids I	10,000	—	10,000	7,500	—	7,500
Buffalo Rapids II	15,000	—	15,000	15,000	—	15,000
Buford-Trenton	55,000	95,297	150,297	11,000	—	11,000
Eden Valley	167,786	—	167,786	167,786	—	167,786
Total Direct Project Costs	447,786	95,297	543,083	421,900	—	421,900
General Administration	79,000	—	79,000	78,100	—	78,100
Total Estimate	526,786	95,297	622,083	500,000	—	500,000

Development Accomplishments and Work Load

The following table shows some of the more important items of development work planned, the amount completed to date, and the amount remaining to be done:

Item	Unit	Total Development Planned	Accomplished to 6/30/50	Remaining to be done 7/1/50
Topographic surveys	acre	181,917	151,078	30,839
Land classification	acre	200,019	145,839	54,180
Unit subdivision	no.	569	476	93
Clearing	acre	36,804	23,187	13,617
Leveling	acre	113,843	45,546	68,297
Farm laterals	mile	1,980	657	1,323
Farm drains	mile	551	258	293
Farm Irrig. structures	no.	17,172	5,817	11,355

Status of Land Development and Farm Sales

Project	Date Authorized	Irrigable Acreage	Percent Development Completed 6/30/50	Number of Tracts	Tracts Sold
Angostura	March 6, 1941	16,180	12	105	-
Balmorhea	April 15,1944	7,520	- **	-	-
Bitterroot	March 22,1944	18,630	8 **	-	-
Buffalo Rapids I	May 15, 1940	14,507	99	96	81
Buffalo Rapids II	May 15, 1940	10,400	98	89	27
Buford-Trenton	Sept. 23,1939	14,729	80	146	101
Dodson *	March 17,1944	1,200	100	-	-
Eden Valley	Sept. 18,1940	20,000	14	-	-
Intake *	Jan. 20, 1944	825	99 **	-	-
Mancos	Oct. 24, 1940	10,000	54 **	2	2
Mirage Flats	April 26,1940	12,000	100	112	112
Missoula *	May 10, 1944	900	100	-	-
Newton *	Oct. 17, 1940	2,225	100	-	-
Post Falls	Jan. 29, 1944	3,260	90 **	17	17
Rapid Valley	Nov. 8, 1939	12,000	- **	-	-
Scofield *	May 24, 1943	12,500	30 **	-	-

* Projects include no Federally-owned land.
** Projects closed, no further development work contemplated.

Payments Due counties and Refunds, Submarginal Land Program, Farm Tenant Act (Permanent Appropriation)

This item covers obligations for the payment to counties of 25 percent of the net revenues received each calendar year from the use of lands administered by the Secretary, and for the refund of unearned amounts received for the use of such lands, under the provisions of Title III of the Bankhead-Jones Farm Tenant Act, approved July 22, 1937, as follows:

Item	Actual 1949	Estimated 1950	Estimated 1951
Payments due counties	$256,075	$238,500	$238,500
Refunds of excess payments	854	1,500	1,500
Total	256,929	240,000	240,000

STATEMENT OF OBLIGATIONS UNDER ALLOTMENTS, WORKING FUNDS, AND TRUST FUNDS

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Flood Control, Department of Agriculture (Soil Conservation Service):			
Preliminary examinations and surveys	$1,056,806	$1,100,000	$808,200
Works of improvement	4,792,451	6,115,775	5,815,000
Total, Flood Control	5,849,257	7,215,775	6,623,200
Construction, Water Conservation and Utility Projects, (Agriculture, Soil Conservation Service):			
Land development on water conservation and utility projects	63,592	95,297	
Working Fund, Agriculture, Soil Conservation Service, Advanced from:			
Department of Interior:			
National Park Service, for the furnishing of trees and shrubs	3,141		
Bureau of Reclamation, for the establishment and measurement of additional snow courses	10,967	465	
Total, Department of the Interior	14,108	465	
Tennessee Valley Authority:			
For preparing and duplicating bibliography on sedimentation	918		
Department of Defense, Department of the Navy:			
Bureau of Yards and Docks, for preparing master erosion control plans for various Naval Ammunition Depots	10,887		

(Continued on next page)

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Department of Defense, Department of the Army:			
Corps of Engineers, for production and delivery of grass seed for the McNary Dam project	3,077	11,923	37,500
Corps of Engineers, for production of pine seedlings	4,184	316	
Total, Department of the Army	7,261	12,239	37,500
Atomic Energy Commission:			
For furnishing seed to be used for erosion control work on Atomic Energy Commission installations ..	4,000	.....	
Total, Working Fund, Agriculture, Soil Conservation Service	37,174	12,704	37,500
Working Fund, Agriculture, General (Soil Conservation Service) Advanced from:			
Department of State:			
For administrative expenses incident to the training of a Korean in soil conservation	75		
Department of Defense, Department of the Army:			
For administrative expenses incident to the training of Japanese agricultural leaders in soil conservation	300		
To cover the cost of providing data in connection with a comprehensive survey of the Arkansas-White-Red River Basin ...	.....	a/ 38,000	

a/ Allotment as of December 31, 1950.

(Continued on next page)

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Department of the Interior:			
Bureau of Reclamation, for studies in connection with the development of an evaluation of the agricultural repayment feasibility of the Weber Basin Reclamation Project, Utah		3,600	
Total, Working Fund, Agriculture, General	375	41,600	
Working Fund, Agriculture, Soil Conservation Service (Special Account) Advanced from Department of the Interior:			
Bureau of Reclamation, for the establishment and measurement of additional snow courses	8,652	957	
Bureau of Reclamation, for preparation and duplicating of bibliography on sedimentation	1,074		
Total, Working Fund, Soil Conservation Service (Special Account)	9,726	957	
Operations and Maintenance, Water Distribution Systems, Water Conservation and Utilization Projects (Trust Fund):			
Receipts for operations and maintenance expenses of the Wyoming Rural Rehabilitation Corporation's water distribution system in the Eden Valley, Wyoming water conservation and utilization project (40 U.S.C. 431-434)..	9,023	11,800	11,800

(Continued on next page)

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Payment in Lieu of Taxes, and Operation and Maintenance Costs, Water Conservation and Utilization Projects (Trust Fund):			
Receipts from land leases for payments in lieu of taxes to States, political subdivisions thereof, and local taxing units, and for operation and maintenance expenses of the resettlement features of certain water conservation and utilization projects (40 U.S.C. 431-434)	30,149	15,000	8,100
Technical Services and Other Assistance, Agricultural Conservation Program, Soil Conservation Service (Trust Fund):			
Providing technical and other assistance to farmers and ranchers in participating counties pursuant to agreements executed with individual Production and Marketing Administration State and County Committees	40,101	218,132	200,000
Miscellaneous Contributed Funds, Department of Agriculture (Soil Conservation Service) (Trust Fund):			
1. For flood control works of improvement on the Los Angeles watershed	50,714	221,622	205,000
2. For flood control works of improvement on the Little Tallahatchie watershed	- -	2,650	5,000
3. For soil and water conservation work in the Antelope Valley soil conservation district of California	1,100	600	600
4. For making land capability surveys and preparing land-capability maps of McCracken County, Kentucky	- -	5,000	- -
Total, Miscellaneous Contributed Funds, Department of Agriculture	51,814	229,872	210,600

(Continued on next page)

Item	Obligations, 1950	Estimated obligations, 1951	Estimated obligations, 1952
Return of Excess Deposits for Reproduction of Photographs, Mosaics, and Maps (Soil Conservation Service) (Trust Fund):			
For refunds of moneys received by the Soil Conservation Service for furnishing reproductions of photographs, mosaics, and maps, which are in excess of the cost of reproduction	967	- -	- -
Expenses, International Development, Executive Office of the President (Allotment to Agriculture)(Soil Conservation Service):			
Administrative expenses in connection with comprehensive training of foreign technicians in the principles and practices of soil and water conservation and proper land use	10,470	a/ 5,700	- -
Expenses, Economic Cooperation Administration, Executive Office of the President (Allotment to Agriculture):			
For expenses incident to the foreign trainee program	- -	a/ 8,130	- -
TOTAL OBLIGATIONS UNDER ALLOTMENT, WORKING FUNDS, AND TRUST FUNDS	6,102,648	7,854,967	7,091,200

a/ Allotment as of December 31, 1950.

PASSENGER MOTOR VEHICLES

The budget estimates of the Soil Conservation Service for the fiscal year 1952 provide for the replacement of 198 passenger motor vehicles at a net cost of $217,800 after considering exchange allowances. With the possible exception of vehicles which may need to be replaced because of destruction by fire or accident, all of the vehicles to be replaced will average approximately nine years of age and will have been driven an average of about 85,000 miles at time of disposal.

The Service authorizes the use of passenger motor vehicles for district conservationists, technical specialists, survey supervisors, research project and nursery technicians and State and Regional Office personnel in areas where public transportation is inadequate or nonexistent, or for types of travel where considerable distances are involved and use of a pickup truck is not feasible. The transportation of "resident" technical personnel to adjacent work areas is generally by means of pickup trucks. Since 1943 the Service has reduced the number of its passenger cars by 141 vehicles (8.5 percent). By June 30, 1952 it is anticipated that the total number will be further reduced by 96 vehicles, or 6.3 percent below the number in operation June 30, 1950.